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Cover: **The theme for this issue is "operational planning." This month's lead article, "Rehearsal and the Attack Helicopter Battalion," begins on page 2. It stresses the fact that units fight the way they train, prepare and plan for battle. Illustration by SSG Bob Rosenburgh.**

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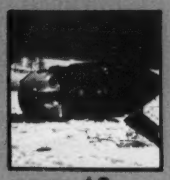

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Major General Ellis D. Parker
Chief, Army Aviation Branch

STRANGE BEDFELLOWS?

THROUGHOUT ITS 200-year history, the U.S. Army has relied on the resourcefulness of soldiers to persevere and overcome obstacles in the paths to our objectives. Indeed, we point to it as a trait or characteristic essential to the successful prosecution of war under the concept of AirLand Battle. Today a period of austerity and budget cuts presents an opportunity for us to draw upon this resourcefulness to continue our peacetime mission of training without degrading our standards for excellence.

Ours is a tremendously costly branch in terms of dollars required to simply sustain current levels of readiness and training. Add to that the force modernization initiatives ongoing and on the drawing board, and we represent a significant portion of the budget for the entire Army. The trust implied with stewardship for such a large operating budget is a responsibility to be shared by every soldier. Each of us must continually search for better ways to conduct business.

Innovative approaches to age-old or recurring problems often give rise to a more efficient solution. And as often as not, the more efficient the solution, the more cost effective it is. One such example involves recent initiatives that were implemented to keep the AH-64 Apache fielding program on track.

The problem we confronted involved qualifying enough pilots to meet the scheduled dates for training at Ft. Hood, TX. The soldiers at the operating level proposed a change to the training program for the qualification course that they had long considered would produce a more highly trained pilot. A by-product of the solution was a cost savings of almost $40,000 per aviator to be trained. It involved more efficient use of the available simulation devices to train aerial gunnery. This was a case of an innovative and efficient solution waiting for the problem to come along.

After realizing the full impact of this proposal, I immediately challenged all organizations at the Army Aviation Center involved with training to reexamine their programs of instruction. My hope was that there were many more efficient and cost-effective solutions waiting for a problem to act as a vehicle to allow implementation. I have to tell you, I have been pleased with the results.

Innovation and austerity are not strange bedfellows. They feed upon each other and give rise to effective ways to accomplish our daily missions. Equally important, they work together to give each soldier a strong sense of responsibility and help develop resourcefulness. This trait is an indicator of the degree to which we are developing the kind of bold, aggressive and risk-taking leaders required to implement AirLand Battle doctrine.

I challenge each of you to continue working for our branch and our Army. Share your ideas to make the most efficient use of all our resources.

REHEARSAL

and the Attack Helicopter Battalion

Major Michael S. Snyder

Although the following scenario is imaginary, the results are authentic: Units that have preplanned and are prepared for battle ultimately will be victorious on the next AirLand battlefield. Because rehearsals are an integral part of training, this article outlines ways and alternate ways to conduct ideal rehearsals.

DURING A RECENT defense of the mythical desert country of Mojave, an attack helicopter battalion (ATKHB) fought under the operational control of a ground maneuver brigade. The battalion received the mission, among others, of attacking the first echelon of an expected enemy regiment well forward in the brigade's sector.

The battalion did not make contact with the enemy until the enemy had overrun the forward platoon of the task force. When the ATKHB made contact, the first attack helicopter company (ATKHC) engaged from unplanned positions within 1,000 meters of the enemy, lost one AH-1 Cobra, and disengaged. When another ATKHC made contact, the company engaged from similarly unplanned positions between 1,000 and 1,500 meters from the enemy, as the enemy broke the assigned "no penetration" line of the brigade.

As the enemy made a leisurely march to the rear of the brigade sector, the companies continued to engage him from unplanned positions between 1,000 and 2,500 meters from him. The unit lost another AH-1 to an A-10's GAU-8. After the brigade received change of mission, but before the attack battalion was notified, two more AH-1s were lost to enemy main tank guns.

The unit fired 60 simulated TOW missiles (using multiple integrated laser engagement system/air-to-ground engagement system (MILES/AGES)), at the enemy. The majority were fired in clear air at ranges of less than 2,500 meters. Before the battle their units' weapons experts checked to ensure they functioned properly and the boresights were accurate. Yet nine AH-1s were able to kill only two T-72 tanks and three BMPs (Russian infantry combat vehicles) while losing four of their own.

Had this unit been called forward from the division rear only minutes before the battle as some aviators believe will occur? No. They received the brigade's warning order 36 hours before the battle.

Had the ground force commander failed to tell them what he expected? No. The attack battalion's tasks were clearly stated in the brigade operations order. The armor battalion task force commander made some changes to his plan immediately before the attack, and the battle did not go as he had expected. But the enemy's actions before making contact with the ground forces were as predicted by the battalion S2. After penetrating the task force rear boundary, the enemy marched along one of the two roads through the sector to a road intersection near a crucial pass in the direction of the operational objective.

Had weather, maintenance, crew endurance, another mission or some other factor prevented the battalion from preparing for the mission? No. The unit conducted a reconnaissance only the day before, which consisted of an overflight of the sector to check for enemy reconnaissance teams.

Is MILES/AGES incapable of killing the vehicles of the National Training Center's (NTC's) opposing force? No. Every test of MILES/AGES that has been done with any degree of control indicates that, in clear air at the ranges used by this unit, a properly boresighted and maintained system will kill effectively. Eight of the nine systems functioned properly when the unit took off. Seven of them were still functioning properly when the unit recovered to its assembly area.

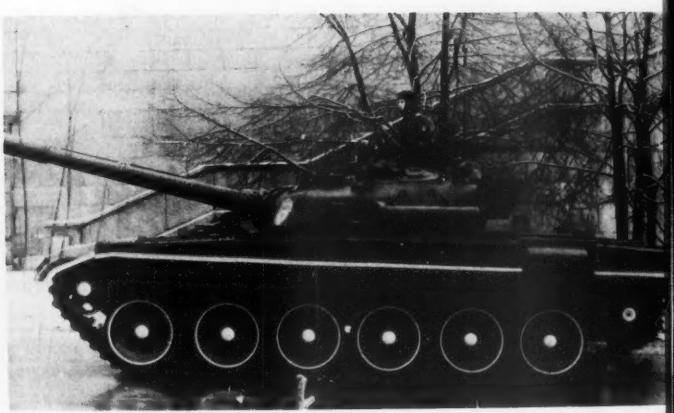
Is the attack helicopter worthless against a mechanized enemy, as many ground brigade commanders have begun to believe? No. Units equipped with the M-1 tank regularly lost battles at the NTC. We should hardly conclude that the tank is worthless. The reason for a victory or a defeat is usually found not in the hardware (although modernized units have an undeniable advantage over those equipped with the M-223) but in the manner in which it is employed. The manner in which units fight is determined largely by the way they train before they arrive at the NTC, but also is influenced by the way in which they plan and prepare for battle.

Field Manual (FM) 34-1, "Intelligence and Electronic Warfare Operations"; FM 71-2, "The Tank and Mechanized Infantry Battalion Task Force (How to Fight)"; FM 101-5, "Staff Organization and Operations"; and the Command and General Staff College's Student Text 100-9 discuss methods and considerations for planning a battle. From these sources an aviator can glean much valuable information. However, rehearsal is not well documented in aviation manuals, or any other manual with which I am familiar.

A partial list of reasons not to rehearse follows. I have heard these reasons used by units at the NTC, but we have all heard them at one time or another.

- We will never have time to do this stuff. The division commander will throw us in when his front has been penetrated and he is about to lose his position.
- If we occup" our battle positions, the enemy will see us and fire artillery on us when he attacks.

Soviet T-72 tank.



Soviet BMP infantry combat vehicle.

• We don't need to do that; the scouts select our battle positions for us based on the situation.

• We don't need to rehearse the plan. A plan only lasts until the first round is fired anyway.

• Why should I try to find and mark that (target reference point (TRP), group, target)? I can't identify it in the middle of the desert anyway. I'll just call in a grid mission.

• Our fire control is in our standing operating procedure (SOP). The gun on the left fires at the targets on the left, etc.

• We don't need to rehearse from a battle position, we'll just find the enemy and use running fire.

• That takes too much time. It would violate my crew's endurance plan.

• The ground commander will tell me where the enemy is and where he wants me to kill him.

• If everyone understands the commander's intent, we can do what is necessary. We don't have to rehearse.

Fortunately, not everyone agrees with this approach to preparation for a battle. General Crosbie E. Saint, former III Corps commander, exposes the fallacy and probable results of unplanned employment of the ATKHB in the October 1987 edition of *Army Aviation*. Our general officers are smart. They will allow us the time to prepare for battle. We must learn to use it wisely.

Operating security is certainly an important consideration. But if you do not know what you are doing, it is not very important whether the enemy knows or not. Good counterreconnaissance, occupation of false battle positions during the rehearsal and avoidance of loitering too long in one position during execution can minimize the risk of rehearsal.

FM 1-112, "Attack Helicopter Battalion," does not say that scouts select battle positions. Scouts advise the ATKHC commander of the enemy situation and recommend battle positions. The commander assigns battle positions and sectors of fire. Because he must control field artillery and close air support (CAS) and report what the scouts have found, he soon reaches task saturation unless the battle positions are planned and prepared beforehand. He must know that the positions meet the criteria of background, range altitude of target, sun or shadow, concealment, rotor wash, adequate maneuver and field of fire. Also, he must be able to report his positions accurately and quickly to the ATKHB fire support officer so that the company can be protected from the effects of friendly fires. Planning, reconnaissance and rehearsal make these things possible.

Plans may not work well if we have failed to anticipate the enemy's actions correctly. A more common reason for the failure of a plan to work after the first round is fired is that the units do not really know whether their plan will work even if the enemy does exactly what they hope he will do. FM 71-1, "Tank and Mechanized Infantry Company Team (How to Fight)," addresses rehearsals in the following way:

Rehearsals...should be conducted under realistic conditions to determine time requirements for critical actions. When the rehearsal indicates that such action cannot be executed in sufficient time to support the plan, the rehearsal must be repeated, or the plan modified.

The accuracy of this statement is repeatedly demonstrated, often by the negative consequences of disregarding it, at the NTC.

Actions such as the marking of TRPs and artillery targets, while not strictly a part of a rehearsal, are a necessary support to a good rehearsal. Rehearsals should include all actions the unit plans to accomplish. Firing using a TRP or firing an artillery target may be one of those actions. If so, the unit must confirm that every person who will use the target or TRP can identify it from the position in which he is to be. After a recent battle, an observer/controller determined that the average target location error of the aeroscouts' spot reports to the ground brigade was 1.4 kilometers. Aeroscout calls for fire usually contain similar errors. Considering the flat desert terrain of the NTC, this error is not surprising. While such reports are adequate to allow the maneuver of attack helicopter companies, they are not nearly good enough to achieve effective first round artillery fires.

Fire distribution also depends on knowing what can be seen from the battle position. If everyone cannot see the TRP, it will not be useful. If everyone does not have the same view of the enemy, SOPs such as "the targets on the left" are not adequate. The question seldom answered by these SOPs is, "To the left of what?" Such techniques may be necessary during a meeting engagement, but we can do better. The price of improvement, however, is rehearsal.

Engagement areas in open terrain, FM 1-112 notwithstanding, may not have suitable battle positions. When the unit decides that running fire is the best way to kill the enemy, a rehearsal is even more strongly indicated. Experience at the NTC has shown running fire to be more effective but extremely dangerous. The danger is that the unit will fly within the range of tank and BMP main guns, which can be effective killers of helicopters. An effective way to prevent flying too close to the enemy is to have practiced the flight pattern on the terrain. Turning points can be identified by map reconnaissance and confirmed during the rehearsal. The scouts can assist the guns by telling them when to turn. Depending on the gunner to calculate

the turning point, using the sight while he is also tracking the target, has not worked well.

The idea that a ground commander can direct the fires of an ATKHB while he is trying to command his own unit has been discredited repeatedly. It is an unfortunate remnant of the days in which armed helicopters were fundamentally fire support systems. Different tasks are required of maneuver and fire support units. Among those peculiar to maneuver units is that of deciding where to defeat the enemy. While the higher commander may decide this question, he expects the attack helicopter commander to figure out how to do it and to be as prepared as possible. The troop leading procedure presented in FM 71-2 is a good start on that preparation. Rehearsal is another step.

Most of us have read that FM 100-5, "Operations," stresses the importance of understanding the commander's intent and of initiative. It also has the following to say about command and control and preparation:

War gaming, rehearsals and realistic training promote initiative and flexibility by preparing units and their leaders for cooperation in the chaos of combat without time-consuming coordination.... At the tactical level, commanders plan fires, maneuver and deep operations in support of their concepts of operations, wargame enemy options, and prepare deceptions to entrap the enemy.... Units use available time to train for and rehearse their specific tasks.

There are many reasons not to rehearse, none of which is very compelling. But rehearsals do take time from rest and maintenance activities, both of which are important aspects of preparation. Is there a positive reason to rehearse? If you want to know that your plan can be executed as you have envisioned and you want to be sure that your soldiers understand what you expect of them, there is. If you want to know that your battle positions will support your engagement areas; if you want to be sure that your scouts can observe their named air defense ground environment and identify their artillery targets; if you want to know that your frequency modulation retransmission station is in the right place; if you want to be sure that your pilots can find the ammunition cache; if you want to know that the forward arming and refueling point (FARP) can be moved in the time you estimated and that the personnel can find the proposed location, there is.

Since you're still reading, you are probably thinking, *"OK, how do I do a rehearsal?"* There are many ways to rehearse, some better than others. The method you choose will be the one that your particular situation allows, and thus may not be the same every time. The best rehearsal is one in which the entire force participates. That means not just your battalion, but the brigade and all of its combat, combat support (CS) and combat service support (CSS) elements. By rehearsing the entire force, you will gain an idea not only of whether your unit can execute the plan, but also of whether everyone who must support you or stay out of the way of your ground elements will be able to do so during the battle. Such an ideal rehearsal should take place on the terrain where you intend to fight at the time you expect the enemy to arrive. (This will allow you to assess the suitability of your battle positions.) An ideal rehearsal also should be oriented on a force that simulates the enemy you expect, not necessarily in size but that follows the route and maintains the speed that you have planned. An ideal person to simulate the enemy is the commander. He can check whether your positions are adequate and provide feedback when you conduct an afteraction review of the rehearsal.

You should identify and report, move units and fire artillery. (This can be simulated; the important issues are whether you can communicate and whether the artillery will be in position to provide those fires that are crucial to your plan.) Cycle through the cache and FARPs. Displace any elements that you plan to move during the battle; conduct reliefs onstation, passages of lines, battle hangovers and anything else you intend to do during the fight. This rehearsal should, of course, cover your selected course of action to the full depth of the battlefield. If you have time, you should also rehearse the contingencies you consider most likely.

Companies should concentrate on their movements and especially on their fire control. They should verify their battle positions and individual firing positions, and identify TRPs and artillery targets. Targets on which you plan to employ the joint air attack team should receive special attention, including having the company commander transmit his artillery call for fire. Activate any airspace coordination area, if necessary, and give the briefing to a simulated CAS flight lead. Simulation may be necessary unless the Air Force is able to be present, but you can probably use an air liaison officer to simulate the actual CAS flight. If running fire is to be used in a particular enemy aircraft, this is the time to verify the flight path, missile firing and turning points and assign responsibility to the scout who will keep the guns from flying too close to the enemy. These points may have to be adjusted when the enemy attacks on a slightly different route, but the companies will find it easier to adjust than to create a plan "on the run." Scouts can identify likely observation point locations and those enemy routes that threaten the security of the company and require surveillance.

During the rehearsal you may find enemy reconnaissance elements, and should be prepared to deal with them. That possibility is an extra benefit of the rehearsal. After they are subdued, the rehearsal should continue. A thorough afteraction review should identify those aspects of the plan that require more work. Ideally, if changes are made, or if execution is not adequate, the rehearsal should be repeated.

This idea is achievable in a defensive scenario, at least to the extent of rehearsing your own battalion. Whether you can convince the ground forces to rehearse is more important than the many other things the ground forces have to do. It is more difficult to replicate the terrain and movements of the force in an offensive scenario, but it can be done with some imagination. At least the critical actions at the objective should be rehearsed. If your mission is to defeat counterattacks, you can begin with surveillance of the counterattack avenues of approach and simulate as you did during the defensive scenario. Exploitation and pursuit operations may require even more imagination, but are not less important because they are more difficult.

When you absolutely cannot rehearse on the terrain, there are alternatives. One technique that has been used by units at the NTC is to construct a terrain model, essentially a very large sand table, on which the unit can walk through the battle. Engineer tape can be used to mark, and 3 by 5 cards to label, terrain features, engagement areas, battle positions and targets. This technique requires simulation of CS and CSS activities. It limits the number of participants and does not answer visibility and communications questions. It also does not allow you to fly. It also is just as good for offensive as for defensive missions, although the limitations remain.

The typically small sand table rehearsal requires fewer resources, but is commensurately less rewarding. Every effort still should be made to practice every part of your plan, including issuing commands to the companies, moving ground assets, making actual calls for fire and spot

The multiple integrated laser engagement system/air-to-ground engagement system on the AH-1 Cobra.

reports, finding the ammunition cache, etc. Not allowing the S2 to see the sand table, but having him track the enemy by reports and advise the commander, may add some realism to his part of the exercise.

A map may be used for a rehearsal. This requires little effort, but presents a tempting trap. Many units have conducted what was really little more than a map reconnaissance for battle positions or a limited wargame to evaluate a course of action and thought it was a rehearsal. A rehearsal is not an attempt to determine a course of action. It is a practice execution of the course of action (and as many contingencies as resources allow). Its purpose is to ensure that units are as good in practice as they sounded during the wargame and that everyone knows what to do and when do to it. An afteraction review should discuss those items that can be improved, but a rehearsal should follow a plan.

Time and crew endurance may limit rehearsals, as may weather, enemy activity or maintenance. Commanders and their staffs overcome a multitude of problems everyday. The limitations on conducting rehearsals are merely another set of problems to be solved. It is obviously easier to accept one of the plausible excuses listed above than to take on yet another task. A MILES kill code is not, after all, the same thing as a burning helicopter with two of your soldiers aboard. But it is an indication of what might happen. As an afteraction review allows us to learn from the past, a rehearsal allows us to learn from the future and to improve it if we can.

ABOUT THE AUTHOR

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Helicopter air combat as viewed from the pilot's seat of an AH-1 Cobra.

illustration by Mark McCandish of General Dynamics

4/2 CAV

It's Called J-Series Leadership

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4th Squadron, 2d Armored Cavalry Regiment
APO New York

ACTIVATED UNDER the J-series modified table of organization and equipment (MTOE) in October 1984, the 4th Squadron, 2d Armored Cavalry Regiment (ACR) has had 3 years to sort out the particulars and idiosyncrasies of implementing and making an organization of 500 officers and troopers work on a daily basis. The mission of the squadron is surveillance and security operations along 650 kilometers of potentially hostile borders between the Federal Republic of Germany (West Germany) and the Warsaw Pact nations of the German Democratic Republic (East Germany) and Czechoslovakia.

Recently, the leadership of the squadron conducted an informal inprogress review (IPR) to assess the organization's operations under J-series. Emphasis was placed on those past actions and methods, used to date, that have ensured the multifaceted missions challenging the squadron, and summed up in the squadron mission statement: "Train to Fight and Conduct Border Surveillance," are accomplished. As a result of the IPR, we best described what and how we do it as "J-series leadership."

Background

The squadron was activated on 16 October 1984, under MTOE 17265JE101, regimental combat aviation squadron. The nucleus of troops and equipment came from the H-series air and support troops that, before activation,

When the 4/2 Cav was activated to implement the force modernization and Army of Excellence initiatives, skeptism ran high. But, functioning under the J-series leadership concept has resulted in a more responsive, leader-driven organization than operating under the H-series plan.

were assigned to the regiment's command and control squadron. The initial organization included a headquarters and headquarters troop (HHT), a general support aviation troop, three air cavalry troops and two attack helicopter troops. The initial reorganization under J-series, as with any change, was viewed with curiosity and concern, and encountered a certain amount of resistance. As is particular to most cavalry units, the time for any prolonged scrutiny was not available, and the mission of making this streamlined, leader focused organization work was the priority.

The 2d ACR border surveillance is conducted through the assignment of three sectors to each armored cavalry squadron. Each squadron is responsible for year-round, daily ground surveillance and accomplishes this through a ground troop rotation, occupying a sector border camp from which surveillance operations are conducted. Aerial surveillance operations are conducted from Feucht Army Airfield, with all air and ground surveillance activities controlled through the regimental operations center.

Structuring

The squadron's conversion to J-series allowed assignment of an air cavalry troop to each line squadron as a habitual relationship, mirroring the ground surveillance sector. Through this organization, a continual relationship between the cavalry troop and the armored cavalry squadron has been established. The air cavalry troop commander picked up an additional hat, that of aviation staff officer to the ground squadron commander. The commander advises the staff officer on all matters pertaining to the use of air cavalry and attached assets for surveillance and tactical operation.

The aviation unit maintenance (AVUM) platoon of the HHT was responsible for operations to provide maintenance support beyond troop organizational capabilities. It became readily apparent that a need existed for an autonomous maintenance organization, structured along the existing consolidated maintenance philosophy of the J-series MTOE. Troops and equipment from the AVUM platoon were separated from HHT and placed under a provisional AVUM troop MTOE (later approved). This allowed a dedicated maintenance effort under the leadership of a troop commander whose primary focus was maintenance and a direct chain of command from the squadron commander to the AVUM troop.

Additional modifications of the unit structure included the creation of positions for a squadron motor officer, aviation standards section and border operations officer. Each officer would be the focus of leadership on a particular squadron activity and a central point of contact for those activities.

Sustaining

This brings us to the basics of J-series leadership in 4/2 ACR. The J-series organization is a more responsive, leader-driven organization than its predecessor, H-series. The ratio of commander and senior noncommissioned officer (NCO) to officers and troopers creates an atmosphere of cohesion and a sense of unity. The 4th Squadron's mission dictates operations 365 days a year, in an environment where mistakes easily can translate into an international incident. Leader focusing and a constant flow of operational information is a necessity.

J-series leadership, as executed in the squadron, means commander involvement in every aspect of training, maintenance, safety, administration and trooper welfare. The leadership of the squadron routinely conducts daily IPRs to assess the status of aviation maintenance, training and border surveillance. These IPRs are conducted three times weekly, at the end of the duty day, in the production control section of AVUM troop and take, as a basis, the review of the maintenance status of helicopters assigned to the squadron.

Troop commanders provide the squadron commander with an update of ongoing and future helicopter mainte-

nance activities and the operational readiness rate of the troop. It should be noted here that within the 4th Squadron we use a troop-controlled flight and aircraft schedule; that is to say, while the AVUM troop maintains a squadron flow status, the troop's prerogative is which helicopter will be flown. The AVUM troop commander provides information as to the status of repair parts, squadron maintenance issues, as well as the status and availability of shop services. This enables the troops to logically schedule aircraft for use as well as coordinate with production control for required services.

The remainder of the IPR, on an as needed basis, is dedicated to a review of training and administrative issues considered necessary. This often results in the combining of missions or activities at the troop level that reduce redundancy and improve efficiency. In addition, this serves as an excellent developmental tool for junior leaders when called upon to represent their troops in the absence of the commander.

Operating

Activities within the squadron are guided by the simple mission statement: "Train to Fight and Conduct Border Surveillance." The weekly training schedule, with a focus on the squadron and troop mission essential task list (METL), is the prime instrument for accomplishing the dictates of the mission. To simplify and centralize the activities of eight troops and the squadron, activities are compiled on a significant activities schedule (SIGACS), which is published weekly. The SIGACS reflects the squadron short-term (90-day) training calendar and incorporates key administrative activities.

Training in the regimental general defense plan (GDP) continues as a leader focused event and incorporates the squadron and troop METL as a foundation. The squadron uses a certification process for assigned officers, warrant officers and NCOs to ensure that individual, as well as collective, missions are accomplished. The certification includes demonstrated knowledge on alert and deployment procedures, routes to and required duties at the local dispersal area, routes to forward assembly areas (FAAs) and duties dealing with sustainment and extended operations at the FAA. Assigned aviators are required as part of certification to brief their unit GDP to the troop commander, with emphasis on the execution of squadron missions and regimental contingency plans.

The welfare of the trooper is a key ingredient to J-series success. It begins and ends with an active sponsorship program for troopers as they arrive and depart the squadron. Building on a solid sponsorship program, every NCO enters a certification and professional development program upon assignment or promotion. The focus of both programs is equipping the NCO with the leadership and performance tools to get the job done. Every trooper and officer in the squadron is involved in a counseling program. As a method, used in the squadron, monthly leave and earning statements are accompanied by a counseling form. The first line leader knows monthly pay period activities are not complete until face-to-face counselings are completed and forms filed.

Field training exercises involve extensive pre- and post-operation checks at the troop level. Pre-combat inspections (PCIs) are a part of deployment, and usually occur not later than 72 hours before deployment. Troopers' equipment, stored in unit areas for alerts, is inventoried for completeness and serviceability. Required tools and anticipated repair parts are receipted from AVUM and loaded into unit vehicles. Vehicles and aircraft are inspected and placed into operation, to include all electronic counter-countermeasures, survivability and communications systems, as a means of ensuring operability. Units inform the chain of command upon completion of PCIs.

Post-command operations are formatted in much the same manner, with a 72-hour period dedicated to recovery and preparation for no-notice alerts. Squadron vehicles arrive and are immediately sent through a washrack to "knock the big chunks off" before proceeding to offload areas and the motor pool. Upon completion of offloading, units begin final washing, servicing and technical inspection of all equipment, aircraft and vehicles.

Upon completion of all inspections and servicing, work orders are submitted for maintenance actions above unit level. Unit organizational property is inventoried and any losses or damage is annotated and appropriate action initiated. Post-combat operations are completed with an inspection by the squadron commander, checking equipment serviceability, load plans and completeness and the submission of afteraction reports to the squadron S3.

Summary

The constant evolution of manning and materiel within the force had led to the introduction and implementation of the L-series MTOE in the squadron, with an October 1987 effective date. The changes were minor as compared to the differences between H and J series, but to be noted is the validation and creation of an AVUM troop with a general aviation maintenance officer commanding.

J-series leadership is nothing more than attention to detail and an attitude that doing things right is the only way to do it. It involves everyone in the squadron, for it's a team effort. J-series and its successors are winners in every sense of the word.

MONTHLY WRITING AWARD

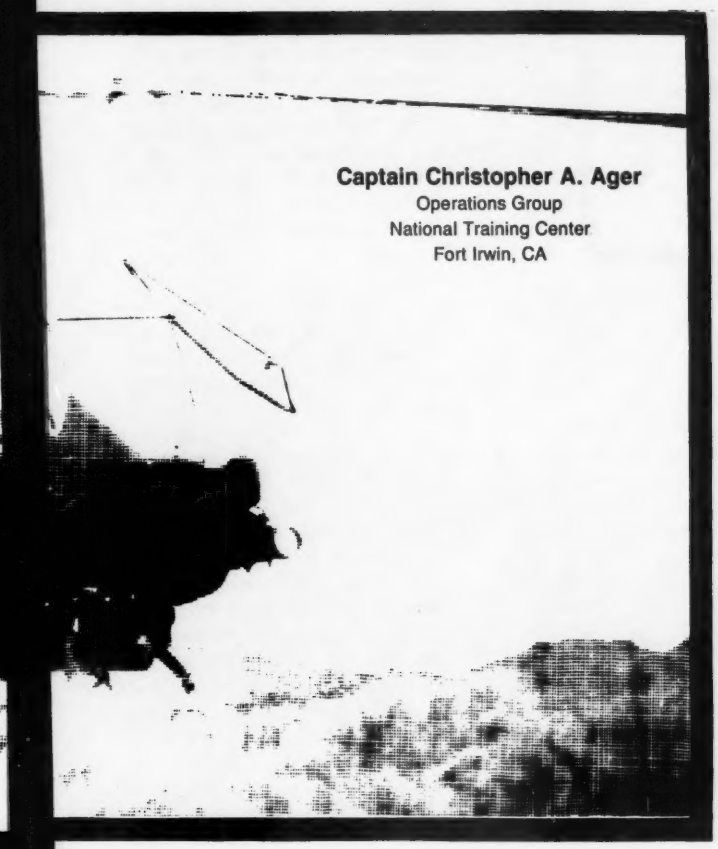
DOWNED PILOT AT THE NTC

AS I DROVE through the main and only gate to Ft. Irwin, CA, on a hot July afternoon in 1985, I noticed a UH-1 Huey lying on its side in the sand of the harsh desert landscape. The sight of the UH-1 encouraged my wife to stop crying for a few moments (the sight of our new home was depressing) and ask me just how realistic the training at the National Training Center (NTC) was going to be. We later discovered that the UH-1 mishap had been a training accident unrelated to the NTC rotation that was in progress. The sight of the UH-1 did, however, set the stage for a quest for realistic training for the attack helicopter battalions (ATKHBs) that participate in the 14-day training exercises.

Upon arrival at the NTC, I found neither guidance nor dedicated resources available to increase the tremendous training opportunities. These opportunities existed for ATKHBs fighting an opposing force (OPFOR) motorized rifle regiment in synchronization with heavy brigades. One event, whose primary benefactor was the Army aviator, was finally entered into the scenario in the winter of 1985. The event was the downed pilot scenario.

The following four vignettes illustrate some of the lessons learned. The lessons range from reactions to the downed pilot exercise to experience gained by dedicated trainers in their attempt to conduct realistic, cost-efficient training.

The first downed pilot exercise occurred somewhat by accident. Until December 1985 each "destroyed" aircraft and crew was allowed to return to the ATKHB assembly area as soon as "destruction" by enemy fire was verified. Training for the crews stopped except for postflight inspec-



Captain Christopher A. Ager
Operations Group
National Training Center
Fort Irwin, CA

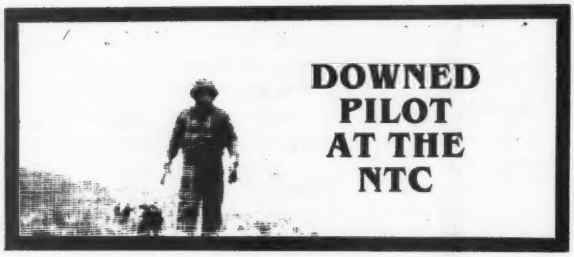
tions and the afteraction review or debrief that followed the end of that day's battle.

On this particular day, three AH-1 Cobras overflew an OPFOR obstacle. One aircraft was "shot-down" by dug-in BMPs (Russian infantry combat vehicles) overwatching the obstacle. The crew landed on the enemy side of the obstacle to allow for verification of the kill code. It suddenly struck me that this was not an enviable position for an aircrew. The pilot was instructed to shutdown the aircraft, and the copilot was instructed to initiate his downed pilot procedures. The pilot was considered killed in action and the aircraft destroyed. The copilot was dumfounded. He sat on the wing and waited for someone to pick him up. When queried about his actions, he responded that he had been given absolutely no instructions for such a situation and that the unit tactical standing operating procedure (TSOP) did not cover this contingency. Help did not arrive. It appeared that this loss was not reported to the battalion. The aircraft and crew were allowed to return to the assembly area 2 hours later when the battle ended.

The tactical lessons learned from the incident highlight the need to report losses as soon as possible. Also, the exercise revealed the need for some plan of action by the crew if downed. The wisdom of hovering over enemy obstacles, which should be covered by fire, was also questioned. More important, we trainers discovered an overall weakness of our people as they responded to unusual circumstances. It was easy to blame the copilot for not taking the initiative, but neither battalion nor controller had established standards that the troops were expected to attain.

After a few downed pilot exercises had been conducted, it was easy to see the word was out. Unit inbriefings now included the possibility of such an exercise. The second vignette covers the exploits of a specialist doorgunner and a warrant officer, WO1, who survived after the destruction of their OH-58 Kiowa by a Russian reconnaissance vehicle in the friendly rear area. Unfortunately for the surviving crewmembers, the only person who knew their location was the dead pilot who had been navigating. Another stroke of bad luck surfaced when the attacking OPFOR regiment chose the area of the "wreckage" as an intermediate objective.

Although the crew was aware of the downed pilot procedure as outlined in the unit TSOP, their inability to determine their location prevented compliance. The proximity of oncoming T-72 tanks and BMPs dictated the more urgent priority of immediate survival. In haste to avoid the enemy, the crew left maps with graphics and Communications-Electronics Operation Instructions in the aircraft. The evading crew took the M-60 machinegun. They initially did an admirable job of avoiding detection and moving to hide positions. However, the white ruff of the pilot's cold weather coat showed up distinctly against the brown desert background. After 4 hours of evading capture, the crew was told that the exercise was about to end. They then



dashed for an abandoned truck and were spotted. The M-60 machinegun was no match for a T-72.

Tactically, we discovered that, although the unit had established a plan to deal with downed crews, the crew had not thought through the procedure enough to secure sensitive items. The crew also felt secure bringing the M-60 but would have been able to move better without it in enemy-held terrain. We trainers learned that the exercise could have continued had we thought ahead and prepared to stay the night.

The next vignette took place with a unit that had been to the NTC several times with the same personnel. Once again a Cobra was downed in "no man's land." The remainder of the team did not forward a loss report as it continued its counterattack mission. The pilot issued casualty cards to the crew. The copilot had a severed leg, but would survive if treated by a medic within 30 minutes. The pilot dragged him from the aircraft, administered a tourniquet from the copilot's survival vest and positioned him in a shadow with his lower body uphill. The pilot then secured sensitive items, buried maps, changed radio frequencies and zeroed secure equipment. The copilot died after calls for assistance on the AN/PRC-90 survival radio went unanswered. The pilot then took the dead copilot's weapon, identification card and letter to his wife. He then simulated the aircraft's being completely destroyed by draining the fuel tank and lighting the JP-4 with a match. The survivor was finally picked up after walking 4 kilometers (km) to a hilltop and directing A-10 Thunderbolts onto OPFOR targets using his AN/PRC-90.

Once again losses were not reported. The downed crew had a good mental knowledge of what to do and continually showed initiative even though knowledge of first aid was limited. The fact that virtually nobody monitored UHF (ultrahigh frequency) guard hindered the crew's survivability.

The final story took place with a unit that had been to NTC so often that I knew most of the pilot's first names. One ATKHC conducted a cross-forward line of own troops raid at dusk. Trainers shot down a Cobra to simulate an SA-13 missile threat and ensure that a downed pilot exercise would occur. The operation order provided by the trainers included coordinating instructions and supporting graphics for partisan linkup. There was no chance for immediate pickup. All arguing about which crewmember was responsible for causing the aircraft to be shot down ended when the battalion assistant trainer flew the aircraft away and left the crew in the desert.

The crew was 30 km behind enemy lines but took solace in having scribbled the downed pilot procedures.

After avoiding the initial enemy search, the crew attempted to move to a linkup point and call local partisans on their AN/PRC-90. The partisans did not respond for 4 hours, and the path to the nearest linkup point was blocked by an enemy supply route. The two victims found a rock outcrop and became familiar with their survival vests. Fortunately, vests were not shed in favor of load bearing equipment as has been done in the past. At midnight radio contact was finally made with "friendlies" and instructions given for an 0700 hours UH-1 extraction the next morning. At 0700 hours the UH-1 overflew the proposed pickup point that was 5 km from the pilots' actual location. The UH-1 was about to return empty when the crewchief spotted a mirror signal.

The crew that had evaded the OPFOR through the night conducted the postmission debrief. The importance of knowing what was in the survival vest and the downed pilots' location was highlighted. Shortcomings in the readability of the MC-1 pocket card magnetic compass (unit vests had no lensatic compasses) and lack of a flashlight hindered navigation. The lack of water was evident as well. Even though each crewmember had a 2-quart canteen, the canteens were almost empty when the aircraft was shot down. The crew had not been able to fill them at the forward assembly area after rehearsing and moving forward. Two MREs (meals ready to eat) carried in calf pockets provided adequate food. The final point brought out was the importance of working as a team and allowing each man's strengths to complement the other. In this case the chain was not as weak as the weakest link, but rather as strong as the strongest link.

Trainers considered several additional topics as well. For instance, safety was considered closely, and the company commander and battalion standardization instructor pilot were consulted before the exercise. Since the

unit had participated in several NTC rotations, the added challenge and interest in the exercise was welcomed. The pilots themselves debriefed the exercise. Finally, we assured the crew that they had done nothing wrong to deserve such "punishment."

The preceding four vignettes are but a few examples of the various experiences encountered by many units. In summary, lessons can be broken down into two categories: tactical lessons learned by the unit and training lessons learned by the trainers. Crews reacted much better to adversity when there was a well-thought plan of action. This plan gave the men confidence and allowed for automatic reactions. Second, the six priorities of crews on the ground appeared to be—

- Immediate personal survival.
- Immediate crew survival.
- Evading the enemy.
- Securing sensitive items.
- Linking up with friendlies.
- Long-term survival/comforts.

The lessons learned in conducting training can be summed up by using some of the following guidelines:

- Soldiers must be aware of the standards and know what is expected.
- Training must remain not only challenging, but also interesting.
- A small group of motivated and dedicated trainers are required to conduct detailed planning and then execute training plans.
- Finally, imagination is required to allow for realistic, low-cost training when there would otherwise be no training conducted.

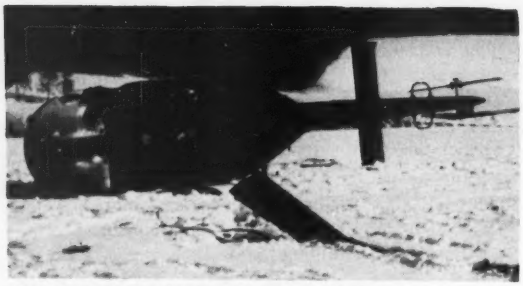
Present but not Contributing Factors

WHEN AN AIRCRAFT crashes, accident investigations and reports follow. The investigators' job is to find the cause to prevent similar accidents in the future. Occasionally, during their search for causes, investigators discover potential problems—things that did not contribute to the accident under investigation, but that might cause problems in the future.

In these reports, "present but not contributing" conditions follow a simple statement: *The findings listed below did not contribute to this accident; however, if left uncorrected, they could have an adverse effect on the safety of future aviation operations.* Investigators make suggestions on ways to eliminate these factors before they cause an accident. This is one of the benefits of the Army accident investigation program.

• Returning to a fieldsite after dark, an OH-58 Kiowa crashed into a hill just short of the intended landing area. Both occupants of the aircraft got out and walked to the unit command tent. They were evacuated about 3½ hours later to a medical facility where they were treated and released. The delay in medical evacuation could have endangered the welfare of the two crewmembers if they had suffered internal injuries.

• During night vision goggles (NVG) proficiency training, the pilot of a UH-60 Black Hawk lost visual reference. The aircraft crashed. The maintenance records of the downed UH-60 had not been maintained to standard. Although that fact did not contribute to the accident, the aircraft was flying in a nonoperational status: required maintenance operational checks were not recorded; maintenance test flights were not being performed when required; and there were no records on the DA Form 2408-15 to indicate phase inspections had been performed. Was the aircraft safe to fly? In this case it was, but it's hard to tell when the records are not kept "by the book."



The pilots of this OH-58 were lucky. Both were eventually treated and released from a medical facility, but not before a 3-hour wait for evacuation from the accident site.

Was this UH-60 safe? Yes, it was. But aircraft records that are not maintained to standard may signal an unsafe aircraft.

• An AH-1 Cobra crashed into a tree during aerial gunnery training. The pilot had a medical restriction requiring him to wear corrective lenses while flying, but he wasn't wearing them. Could 20/20 vision have prevented the accident? Probably not; however, it could mean the difference between a near miss and a midair collision where every pair of eyes counts.

In addition, even though crew rest was not a factor, the potential for chronic aircrew fatigue in this unit was high. Standby crew facilities weren't geared for rest. No night vision adaptation provisions were made and a limited number of crews increased standby duty for each. When

continued on page 27

USAASO SEZ

Communication Readback Hearback

Mr. Lingiam Odems
U.S. Army Aeronautical Services Office
Cameron Station, Alexandria, VA

ARE YOU SURE you heard what the pilot thought you said? Radio communications are a critical link in the air traffic control (ATC) system, and the single most important thought in pilot-controller communications is understanding. *"Cessna three one six zero foxtrot, turn right heading 260, descend and maintain one two thousand"* is an example of a controller-issued instruction that a pilot may acknowledge by responding with "wilco, roger, affirmative" or other words or remarks including the readback. Sometime later you may hear yourself saying: *"Cessna three one six zero foxtrot, where are you going? Your assigned altitude was one two thousand!"*

Deviations of this type can occur because instructions are misread, tuned out, guessed at or when other similar human causal factors cause trip-ups between ear, voice, mind and action. The controller may have little or no control over many of these trip-ups unless the pilot reads back the clearance or instructions.

The Airman's Information Manual addresses the redundancy problem in ATC and cockpit communications in low-key, advisory-style language. "As a means of mutual verification, pilots of airborne aircraft should read back those parts of ATC clearances and instructions containing altitude assignments or vectors...." The readback of numbers serves as a doublecheck between pilots and controllers and reduces the kinds of communication errors that occur when a number is either misheard or is incorrect. As a result, aircraft flight operations manuals have not only adopted this procedure, but have changed the "should" recommendation to "must."

Also, there are pilot training programs that emphasize the importance of the readback of "hold short" or runway crossing clearance information while on the airport surface. Federal Aviation Administration Handbook 7110.65, paragraph 2-27b, states that, "If altitude, heading or other items are read back by the pilot, ensure the readback is correct. If incorrect or incomplete, make corrections as appropriate." Now in this talk/listen/confirm/confirm sequence, the controller must issue a correct clearance to the correct aircraft. Then he must listen to the pilot's readback to ensure that the pilot has heard the message correctly.

Good pilot-controller communications and understanding enhance safety and are the marks of professionalism. Keep your ears on. Don't assume a correct readback; make sure you hear what the pilot thinks you said. Close the loop with good hearback techniques.

In many instances misunderstandings can be attributed to the expectation factor; that is, the recipient (or listener) perceives that he heard what he expected to hear in the message transmitted. Pilots and controllers alike tend to hear what they expect to hear. Deviations from the routine are not noted, and the readback is heard as the transmitted message, whether correct or incorrect.

For example, aircraft A was in a block altitude of 12,000 to 14,000 feet. The instructor pilot and the student both thought the controller told them to turn left to a heading of 010 degrees and descend to and maintain 10,000 feet. At 10,700 feet, the controller requested aircraft A's altitude. The crew responded 10,700 feet. The controller stated the aircraft had been cleared to 12,000 feet, not 10,000 feet. There were two contributing causes for this occurrence: about 99 percent of all clearances from that area are to descend to and maintain 10,000 feet, and as an instructor for many previous flights, the pilot was conditioned to descend to 10,000 feet. The controller may have said 12,000 feet, but the instructor was programed for 10,000 feet.

The ten most common generic types of communication problems are as follows:

- Misinterpretable or phonetic similarity.
- Inaccurate transposition.
- Other inaccuracies in content.
- Incomplete content.
- Ambiguous phraseology.
- Untimely transmission.
- Garbled phraseology.
- Absent or not sent.
- Absent or equipment failure.
- Recipient not monitoring.

For additional information about ATC communication call Mr. Lingiam Odems, AUTOVON 284-7796/6304 or Commercial 202-274-7796/6304.

USAASO invites your questions and comments and may be contacted at AUTOVON 284-7773.

PEARL'S

Personal Equipment And Rescue/survival Lowdown

U.S. Army Support Activity—Supply Digest

The Supply Digest, published about four times a year, disseminates logistical information to Army commands and activities. It highlights supply procedures and supplements general supply information available in official publications. The point of contact (POC) for the Supply Digest is Diane Gomez, STRAP-P, U.S. Army Support Activity, P.O. Box 13480, Philadelphia, PA 19101-3460; AUTOVON 444-2531.

Administrative Information

The U.S. Army Support Activity, Philadelphia, operates under the jurisdiction of the U.S. Army Troop Command in St. Louis, MO. This activity executes the service item control center functions as set forth in Army Regulation (AR) 710-1 for the following Federal Supply Classifications (FSC) assigned to the Defense Logistics Agency and the General Services Administration for integrated materiel management:

Federal Supply Classification
(The title of each FSC is contained in AR 708-1, chapter 5.)

7210	8330	8415	8445	8475	8905	8935	8970
8305	8335	8420	8450	8510	8910	8940	8975
8310	8340	8425	8455	8520	8915	8945	9410
8315	8345	8430	8460	8530	8920	8950	9420
8320	8405	8435	8465	8540	8925	8955	9430
8325	8410	8440	8470	8810	8930	8960	

The U.S. Army Support Activity is the focal POC for Army customers concerning the following matters:

- Resolution of supply problems on clothing and subsistence.
- Determination of general and limited war mobilization planning requirements.
- Management and control of pre-positioned war reserves for which the activity is the accountable supply distribution activity.
- Development of Army program data and special program requirements.
- Planning for introduction of new Army clothing and subsistence items into the supply system.

organization	subject area	symbol and extension
Commander/Deputy U.S. Army Support Activity, Philadelphia		STRAP-G/ STRAP-GD 2500/2501
Management Support Office	Policy, procedures, ADP support, force development, cost reduction, work measurement, review and analysis, Supply Digest, OMA fund budget	STRAP-P 2504/2505
Contingency Materiel Management Division	Policy for logistics, guidance for AMC operational plans, war reserves, theater war reserves, requirements and management of pre-positioned war reserve materiel stocks, stock fund budget	STRAP-M 2506
Materiel Readiness Branch	Support of logistical plans, stock control and accountability, stock fund budget	STRAP-MR 2559
Distribution and Requirements Branch	Positioning and shipment of of pre-positioned war reserve materiel stocks, subsistence data, rotation program	STRAP-MO 2544
Modernization And Logistics Data Management Division	Introduction of new items, equipment authorization documents, cataloging	STRAP-L 2530
Catalog Data Branch	Cataloging, Army master data file, Army adopted item list, specification	STRAP-LC 2533
Supply Division	Item data, supply problems, Army controlled items, special program requirements, medals assembly	STRAP-S 2517
Equipage, Flags and Insignia Branch	Organizational equipage, flags, guidons, insignia, medals	STRAP-SE 2529
Clothing and Footwear Branch	Army controlled items, monetary clothing allowance items, organizational clothing items	STRAP-SC 2534

• Materiel management of clothing and subsistence items.

Note: The U.S. Army Support Activity address is as follows: Commander, U.S. Army Support Activity, ATTN: (See the chart at left for the appropriate office symbol and extension), P.O. Box 13460, Philadelphia, PA 19101-3460.

General Logistics Information Quality Deficiency Reports (QDRs)

Army customers who are dissatisfied with the quality of an item are advised to follow the established policy as stated in AR 702-7 and AR 702-7-1. These regulations establish a system for feedback of quality deficiency data.

All QDRs will be eligible for credit if the deficiency is found to be a valid complaint by a Defense Personnel Support Center (DPSC) clothing and textile quality assurance specialist. A document number must be provided with the report so it can be verified. QDRs without document numbers will not be eligible for credit.

Requisitioners will receive credit on defective items in accordance with the Military Standard Billing System. The POC is Mr. Robert Bednarcik, AUTOVON 444-2538.

Flyer's Hood

DPSC (RIC-S9T) is accepting funded requisitions for the following sizes of the flyer's hood:

Size	National Stock Number	Tariff
Small	8415-01-167-7242	151
Medium	-7243	363
Large	-7244	325
X-Large	-7245	161

Note: These items are the companion piece for the jacket, flyer's, heavyweight nylon, CWU/45-P, NSN 8415-00-310-1111(s). The hood's unit price is $29.45 and the unit of issue is each.

Survival Kit, Individual Vest Type

The survival kit, individual vest type, size small, is now available from DPSC. The new size small kit is intended primarily for use by personnel on flying status exposed to emergency escape and evasion situations.

A replacement component of the kit, the survival vest, SRU-21/P, size small, is also available. The added size small vests fit small bodied male and female aviators (up to 37 inches chest measurement).

The survival kit is authorized in CTA 50-900 under LIN U72733, survival kit, individual vest type. The POC is Mr. Ron Gamache, AUTOVON 444-2514.

Applicable requisitioning information is as follows:

Nomenclature	NSN	U/P	U/I	Source of Supply
Kit, Survival, Sml Indiv Vest Type	8465-01-174-2355	$213.35	EA	S9T
Vest, Survival SRU-21/P	8415-01-173-8098	$80.30	EA	S9T

Aviation Life Support System (ALSS) Specialty Badge

The ALSS specialty badge is a U.S. Air Force initiative. This is certainly a step in the right direction. We will have to obtain the support of our Army Aviation life support equipment (ALSE) community to further the effort.

Medical Unique Management Data File (MUMDF)

Responsibility for printing and distributing the MUMDF microfiche was recently transferred to the U.S. Army Medical Materiel Agency (USAMMA). Distribution of the monthly MUMDF will be suspended temporarily pending the completion of a review of MUMDF printing and distribution procedures. Additional information concerning the status of the MUMDF will be forthcoming. Activities should maintain their current MUMDF microfiche until further notice. The USAMMA POC is CPT Motley, AUTOVON 343-7235.

If you have a question about personal equipment or rescue/survival gear, write PEARL'S, AMC Product Management Office, ATTN: AMCPM-ALSE, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798 or call AUTOVON 693-3573 or Commercial 314-263-3573.

CORRECTION

The *Aviation Digest* used an incorrect byline on the Article "Blacks in Military Aviation" that appeared in the June 1988 issue. The author of the article is Captain Kenneth Perry instead of Captain Perry Smith. The *Aviation Digest* apologizes to Captain Perry for this error.

'The First Man They Look For and the Last They Want to See'

Colonel N. Bruce Chase, M.D.
Aviation Medicine Consultant
U.S. Army Aeromedical Center
Fort Rucker, AL

THOSE WORDS WERE once heard every week in millions of homes across America. Some of you will remember their origin and some will wonder. But what do they have to do with aviation? Well, with a little twist in meaning and context from the original, they describe a relationship found today in Army Aviation.

These days it is fashionable to speak of "track records." One track record of great interest to aviators concerns the inevitable decline on health that the human body encounters in its travel through time and the universe. Sooner or later these bodies of ours are going to be "recalled." But not, we hope, until we have finished our aviation careers and done all the other things we'd planned to do. Aware of the inevitable, Joe Aviator and his colleagues fear the annual baring of body and soul to the flight surgeon. The fear that this year's examination will uncover some great problem that will "ground" him or her forever is a major concern.

Aviators by their very nature are risk takers. There is always the risk of weather, mechanical gremlins, being shot at in times of conflict and other sundry adversities. Aviators are at their best behavior, so to speak, when they can take a calculated risk. It is the fear of the unknown risk that strikes terror into these brave folks. What is the risk in going to the flight surgeon? Like many fears, it is often an exaggerated one. The risk of serious damage to one's aviation career is not as great as many people think. For this, aviators can thank new philosophies and policies.

Administratively, the future of the health-impaired flyer rests with the unit commander, the flight surgeon, the commander of the U.S. Army Aeromedical Center (USAAMC), Ft. Rucker, AL,

and the Total Army Personnel Agency (TAPA). "Conservation of the flying strength" (borrowed from the Academy of Health Sciences goal "to conserve the fighting strength") is the local flight surgeon's and the commander, USAAMC's principal goal and philosophy. We in the aeromedical community do not take lightly the need to salvage careers and the many years of expertise that would otherwise be lost because of unnecessary medical disqualifications from flying duty. Every flight surgeon who is trained at Ft. Rucker is instilled with that concern.

Thanks to a policy change published by the commander, USAAMC, last fall, local flight surgeons now have the authority to recommend to aviation unit commanders the temporary return to flying duty of most aviators who are medically disqualified. Previously, such "temporary waivers" were limited to a few conditions such as excessive hearing loss and uncorrected vision of less than 20/100. Now, those same local flight surgeons may recommend the temporary waiver for all but the most seriously ill aviators. These are the ones who don't pass the commonsense test. This includes persons who have had heart attacks, strokes, untreated alcoholism, psychosis and the like.

A review of the actual USAAMC waiver and review files shows that the number of waivers requested for fiscal year 1987 was 1,369. Had the new policy, initiated in September 1987, been in effect for the entire year, 357 aviators would not have been grounded for an average of 144 days, which equals to a manpower savings of 51,408 mandays. Out of those requests for waiver, 1,128 were eventually granted by TAPA on the basis of a favorable recommendation from the commander, USAAMC. That is an 87.5 percent favorable outcome. We think that is a substantial contribution to the mission capability and the combat readiness of Army Aviation! Those who were not granted waivers were, again, those who did not pass the commonsense test. They were the ones that no commander would risk in the cockpit, and no aviator would want as a copilot. They were the ones who were at risk of sudden incapacitation from a repeat heart attack, stroke, and the like, or who had suicidal tendencies, or other clearly disqualifying conditions.

The system isn't perfect. There always will be honest differences of opinion, in equivocal cases, even among the best experts. To assist the commander, USAAMC, in dealing with the difficult cases, Ft. Rucker has an Aeromedical Consultants Advisory Panel (ACAP). This panel is made up of not only the leading aeromedical experts (Ft. Rucker flight surgeon ophthalmologists, flight surgeon psychiatrists and the like), but also two members who are not physicians. These two individuals are very important to the ACAP. They are two experienced aviators appointed by the commanding general of the Aviation Center. One is an officer aviator while the other is a warrant officer aviator. They bring to the ACAP their professional expertise and points of view on medical disqualification. They, like the physician members of the panel, may not always agree on a recommended disposition, which illustrates that in the final analysis it may be a "judgment call" as to whether or not someone should fly.

Here are some important points to remember for your next medical examination.

- The flight surgeon is on your side. He won't recommend a medical restriction unless it is necessary for the safety of the individual or the unit. He will recommend a temporary clearance for those conditions that are disqualifying but are likely to be eventually waived.
- The commander, USAAMC, and his advisors, the ACAP. are on your side. They are working to conserve the flying strength of Army Aviation. If it is safe for you to return to flying duty, that will be their recommendation to TAPA.

The man who they (the bad guys) watched for but hoped not to see was Marshall Matt Dillon on "Gunsmoke." Don't be a "bad guy" in Army Aviation. If you have a medical problem, get help from your flight surgeon before it is too late. It is his sacred trust to keep you flying as long as your safety and that of the unit permit. He will *conserve the flying strength!*

The Aviation Medicine Report is a monthly report from the Aviation Medicine Consultant of TSG. Please forward subject matter of current aeromedical importance for editorial consideration to U.S. Army Aeromedical Center, ATTN: HSXY-ADJ, Ft. Rucker, AL 36362-5333.

illustration by Bill Totty

LAST FLIGHT OF THE TH-55

Mr. Al Endicott
Public Affairs Office, U.S. Army Aviation Center, Fort Rucker, AL

ARMY AVIATION paid its final fond farewell to the TH-55 Osage on 3 June 1988, at Shell Army Airfield, U.S. Army Aviation Center, Ft. Rucker, AL. The last reciprocating engine and helicopter in the Army's fleet, the Osage was phased out of the inventory because of the Army's new multitrack flight training system.

Second Lieutenant (2LT) Paul J. Meyer from the Initial Entry Rotary Wing Aviator Class 88-12 (Orange Flight) performed the last flight of a student undergoing primary flight training. Mr. Robert Cooney, a Department of the Army civilian assigned to the Contract Evaluation Branch, Shell Detachment, gave 2LT Meyer his evaluation.

The TH-55 was the Army's primary training helicopter from 1965 to 1973 at Ft. Wolters, TX. Army flight training was moved to Ft. Rucker in 1973. Over the years, the "Mattel Messerschmidt" has accumulated an enviable safety record.

This small, 2-seat trainer has accumulated more than 3.9 million flight hours in training more than 47,000 students. Since 1979, more than 770,000 flight hours have been logged, with 1 class A accident.

Colonel Clinton B. Boyd, commander of the Aviation Training Brigade at Ft. Rucker emphasized that, "This event is noteworthy not only to the members of the orange hats class 88-12, but to most Army aviators who, at one point or another, trained in this machine."

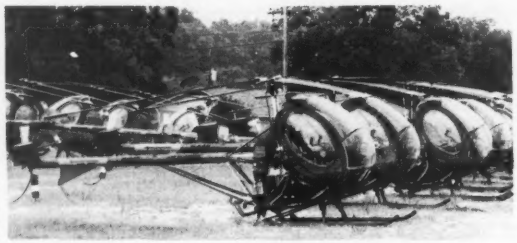


photo by SPC Frank T. Sullivan

TH-55 Osage helicopters are lined up for the final time at Shell Army Airfield, Ft. Rucker, AL, on 3 June 1988.

photo by SPC Frank T. Sullivan

A soldier from Shell Field Detachment, Ft. Rucker, AL, prepares to tie down the TH-55 Osage helicopter after its final flight on 3 June 1988.

Brigadier General (BG) Rodney D. Wolfe, assistant commandant at Ft. Rucker, who has memories of the little trainer being retired, remembered:

"As you watch something, a part of history, come to an end, it always brings back memories. I was thinking of when I became exposed to it as a relatively new major at Mineral Wells, TX. During the 2 years I was there, I came to appreciate it, and it has served the Army extremely well.

"For those of us who have been around a long time, and we're saying goodbye to one of those today , we know that we have to make room for new aircraft and new people to take our places," BG Wolfe said.

Mr. Fred Vernon, a Pan American flight instructor who trained 2LT Meyer for his checkride, watched anxiously on the sidelines during the final flight. Mr. Vernon was an instructor pilot in the TH-55 for 9 years at Mineral Wells, moving to Ft. Rucker on the shift of the Army flight training to its new home. He retired from his demanding job on completion of that final flight and plans to do a lot of fishing.

A plaque that was presented to BG Wolfe signifies the final flight and contains the names of the student, instructor pilot and the evaluator for the final flight. It will be presented later to the Army Aviation Museum.

The TH-55 will no longer be an active force in Army flight; however, it will not be forgotten by the thousands of Army aviators who received their first training in the little bird and performed their first solo in the mighty Osage.

MULTITRACK

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A NEW MILESTONE was set in the history of Army Aviation on 25 May 1988, at the Army Aviation Center, Ft. Rucker, AL. Two students from the Initial Entry Rotary Wing (IERW) Course, warrant officer section, went airborne in a UH-1 Huey helicopter under the recently implemented multitrack training program at Lowe Army Airfield.

First they were given a classroom briefing and a preflight check. Then Warrant Officer Candidates Edward E. Huey and Brent R. Huntsman of Red Flight, IERW Class 88-15, became the first two class members to ride in a Huey for their initial orientation flight. With them was instructor pilot Mr. John Harris of Pan American Support Services.

Under the multitrack program, students receive primary and instrument training in the Huey. After instrument training, the new aviator will complete IERW in his specific combat aircraft, which may be the Huey, OH-58 Kiowa, UH-60 Black Hawk or AH-1 Cobra.

During the 9-month course, the student pilots receive about 175 to 186 hours of flight training and numerous hours of academic training. The multitrack program will match about the same number of flight hours with 62.5 hours allocated for 10 weeks of primary training in the Huey, 20 hours allocated to 8 weeks of instrument training, and 88.5 to 92.5 hours allocated for 36 to 40 weeks of flying in a specific combat aircraft.

Under the old flight training program, students received 50 hours of primary flight training in the TH-55 Osage, 45 flight hours in the Huey and 80 hours of combat skills training in either the Huey or the Kiowa. Later, if the aviator were tracked to another aircraft, then he spent 25 to 46.9 flight hours for 6 to 14 weeks going through a transition course to qualify in another combat aircraft.

"The students did their initial training in the Osage. However, they never flew one of those aircraft during their Army careers again," said Lieutenant Colonel (LTC) James Orahood, commander, lst Battalion, 212th Aviation Regiment, Aviation Training Brigade. "They also received training on various generations of aircraft, which included the Osage, Huey, Black Hawk and AH-64 Apache. Some of the skills the students learned in one aircraft did not transfer to another aircraft so some of the skills had to be 'unlearned.' The plan is for the students to fly a primary mission aircraft," LTC Orahood added. Flying the same type of aircraft in an aviator's career increases proficiency in the pilot's ability to fly that aircraft.

According to Army officials implementation of multitrack will reduce the need for transition courses; however, there will be some exceptions, depending on the needs of the Army and duty assignments. LTC Orahood said the multitrack program would save resources. If an aviator goes through as a Huey pilot, then he or she will not have to turn around and go through a transition course to become a Black Hawk pilot.

"It's fairly common knowledge that if you (a pilot) do not keep flying the same aircraft on repetitive tours, your skills deteriorate and you lose those skills," said LTC Orahood. He noted the sophistication of newer aircraft as another reason for wiser resource management. "It makes a lot of sense from an effectiveness standpoint and from a resource standpoint," he added.

Your Next Assignment: Academic Instructor

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YOU HAVE JUST received your orders—your next assignment is Ft. Rucker, AL. "Great," you think, "I'm going back to the home of Army Aviation, the focal point of my branch." So naturally, you begin to wonder about your options. Will I wind up being a commander, an instructor pilot, an academic instructor or in some other staff position? Then, you report in. "Congratulations! Welcome to the department! Your job here will be as an academic instructor!" We all understand what all those "other duties" are—but what is this academic instructor business all about? What does it take to be an instructor, and what exactly do instructors do beyond teaching?

First of all, being an instructor is important from an exposure standpoint. You will expose the latest in aviation tactics, techniques and procedures to students who will soon be out in units from Korea to Germany, applying what you have taught them. If you only taught initial entry rotary wing, you would see more than 400 students every 6 months. If you add in other courses such as the Enlisted Aerial Observers Course, the Master Warrant Officer Training Course or the Pre-Command Course, you will soon have a great impact upon the way we do our business. Then, there is personal exposure. Instructors are often greeted with, "Hey, didn't you teach me night vision goggles when I was in flight school?" Or, "Didn't you teach joint air attack team to my Pre-Command Course...and now you want a job...well, let's talk...." So, exposure can be very important. It helps establish and retain valuable contacts in the aviation community. But just what is involved in being an instructor?

First, not everyone is cut out to be an academic instructor. You must have the motivation to develop and maintain a thorough knowledge of the subject matter, as well as possess the communicative skills to adequately present this material to the students.

The Directorate of Training and Doctrine, Staff and Faculty Development Division, Ft. Rucker, conducts several programs that help trainees acquire and develop the skills necessary to become an effective academic instructor. As a minimum, all prospective instructors must attend a 3-week Instructor Training Course (ITC). It is here that the basic instructor skills and lesson plan development are taught. In addition, a 2-week Systems Approach to Training

(SAT) Course is recommended for all new instructors. Because academic instructors are also training developers, there has been increased emphasis on attending this course. For those unfamiliar with the SAT process (reference TRADOC Regulation 350-7), this is a five-phased approach to training development that outlines systematic procedures for analysis, design, development, implementation and evaluation of training programs. By correctly applying the principles of SAT, we can ensure that all tasks that are selected for training are adequately presented and evaluated within the program of instruction.

Then, if you are lucky enough (and good enough), you may be selected to serve as a facilitator for small group instructor in the Aviation Officer Advanced Course or one of the other courses (Aviation Noncommissioned Officer Course/Basic Noncommissioned Officer Course/Master Warrant Officer Training Course) that will be using this type of instruction. These facilitators/instructors guide teams of students through much of their training. They also work more closely with their students over a longer period of time than conventional instructors. In addition to ITC, these instructors receive training in team leadership and group dynamic skills to help them develop and fulfill this role. Technical and tactical instructors are in high demand when they return to the field.

The academic instructor's responsibilities do not revolve solely around the classroom. He or she is also a developer of training, a subject matter expert, and most likely the writer of that doctrinal subject. They gain valuable insight into current doctrine, tactics and techniques from constant exposure to students returning from field assignments who share their experiences and knowledge of latest developments. They use these ideas to help shape future doctrine and tactics. This is the philosophy behind School Model 83—it gives training departments the responsibility for designing, developing and implementing programs for training. This includes the writing of learning objectives, lesson plans, student handouts and examinations.

The Directorate of Evaluation and Standardization members, specifically the Evaluation Division, are involved in evaluating instructor capabilities and the application of SAT. Our evaluations have shown that the instructor corps at the Aviation Center is well trained, dedicated and motivated toward their roles in the classroom. Increased emphasis by the command group in training all instructors on the SAT process has led to programs of instruction that are well developed and oriented toward realistic job performance measures. So, being an instructor at the Aviation Center is being part of a winning team.

As an academic instructor, one must be a subject matter expert, an effective communicator and a training developer. There is no doubt that these are steadfast qualities that our commanders are seeking in their officers and noncommissioned officers. Being an academic instructor at Ft. Rucker might just be a golden opportunity that pays some pretty hefty personal dividends, while allowing you to make a significant contribution to your branch and our future Army.

DES welcomes your inquiries and requests to focus attention on an area of major importance. Write to us at: Commander, U.S. Army Aviation Center, ATTN: ATZQ-ES, Ft. Rucker, AL 36362-5208; or call us at AUTOVON 558-3504 or Commercial 205-255-3504. After duty hours call Ft. Rucker Hotline, AUTOVON 558-6487 or Commercial 205-255-6487 and leave a message.

U.S. Army Class A Aviation Flight Mishaps

	Number	Flying Hours	Rate	Army Fatalities	Total Cost (in millions)
FY87 (through 15 July)	30	1,300,350	2.31	41	$67.1
FY88 (through 15 July)	26	1,353,429*	1.92	38	$58.1

*estimated

AVIATION PERSONNEL NOTES

Promotion Selection Board for Captain (Army Competitive Category)

The message from the March 1988 Captains Promotion Selection Board is clear: The Army is seeking those "best qualified," merely being "fully qualified" is courting a passover. Before 1985 selection rates averaged more than 95 percent; boards were virtually promoting all lieutenants determined to be fully qualified. Since late 1985 captains boards have used the quota-based method to select the best qualified and as a result have had selection percentage rates in the mid 80s.

The latest results from the March 1988 board (shown in the figure below) continue the trend and show keen competition for promotion. Army aviators fared significantly better than their combat arms contemporaries yet were not immune from the trend.

Also of interest are comments from the Aviation Branch member of the board:

"Our (aviation) rating chain must understand that an aviator's first report will, most likely, determine if the aviator will be passed over rather than be promoted." This is because Aviation Branch lieutenants historically have "thin" files, mostly because of lengthy training compared to their contemporaries. The effect of not having two or three efficiency reports creates the perception that aviation lieutenants are in the "average" category for promotion.

"The senior rater remains the key to selecting the best from the rest.... Senior raters made a positive impact by keeping their message short, having powerfully supportive leading and closing sentences, and substantiating, with words, what the rater had 'box checked.'

"Photographs were discussed at length. Aviators and male West Point graduates got the reputation of being so ugly that they refused to go to the photographer. Since I knew all aviators and most West Pointers to be exceptionally handsome people, I believed that the lack of photographs was due to other reasons."

COMBAT ARMS SUMMARY

	Previously Considered			First Time Considered			Recapitulation		
	Eligible	Selected	Percent Selected	Eligible	Selected	Percent Selected	Total Eligible	Total Selected	Percent Selected
Aviation	17	7	41.1	328	300	91.4	345	307	88.9
Air Defense	12	2	16.6	259	219	84.5	271	221	81.5
Armor	20	4	20.0	377	309	81.9	397	313	78.8
Infantry	44	13	29.5	741	594	80.1	785	607	77.3
Field Artillery	33	2	6.0	603	452	74.9	636	454	71.3
Army Totals	213	42	19.7	3,999	3,317	82.9	4,212	3,359	79.7

Advanced Civil Schooling (ACS)

Commissioned and warrant officers who apply for the ACS program provide qualified people to fill the Army Educational Requirement Board (AERB) positions that commanders have designated critical to mission areas. The ACS program is a great benefit to selected officers while simultaneously meeting the Army's needs. This will fully pay for a college degree in the individual's functional area, beginning at the baccalaureate level for warrant officers through a doctoral degree for commissioned officers. A utilization tour will normally occur immediately after completion of ACS and will be for 3 years.

Each year usually at least 20 Aviation Branch members are selected for the ACS program, with more expected for the future. Aviation disciplines currently in high demand are aerospace engineering; space systems operations; joint command, control and communications; space physics; and composite materials. The guiding regulations are AR 621-1, "Training of Military Personnel at Civilian Institutions," for ACS and AR 621-108, "Military Personnel Requirements for Civilian Education," for AERB.

Field Grade Officer Refresher Course

The Field Grade Officer Refresher Course is currently not available because of extensive revision. The programed text-based course is expected to again be ready for mailing late in the first quarter of fiscal year 1989.

Acquired Immune Deficiency Syndrome (AIDS) Policy

The Army policy is that all aircrewmembers who are Human Immune Deficiency Virus (HIV)-positive will be permanently disqualified from aviation service. Now in effect, this policy will be published as a change to AR 40-501, "Standards of Medical Fitness." Aviation unit commanders will ground HIV-positive soldiers according to AR 600-110, "Identification, Surveillance, and Administration of Personnel Infected with Human Immune Deficiency Virus (HIV)," paragraph 6-4c(5), since flight surgeons may not be knowledgeable of those tested as HIV-positive.

U.S. Army Safety Center

continued from page 16

major additional duties are considered, this could become a significant flight safety factor.

- A crewmember was killed when he walked into his aircraft's tail rotor. The investigation revealed that the UH-1 Huey had an air-to-ground engagement system/air defense system installed by a civilian contractor. It did not have the interim statement of airworthiness. The interim statement addressed flight restrictions to aircraft so equipped. Without this statement, the aviators were unaware of restricted maneuvers. They could not have properly computed aircraft weight and balance.
- An AH-1 crashed during nap-of-the-earth flight training. Besides the accident cause, investigators found that the engine wasn't flushed according to technical manual guidance. The compressor must be cleared every 25 hours when operating in a dusty, sandy or loose-grass environment such as the one in which the aircraft was operating. Unit records showed that the engines were only flushed during the 150-hour phases.
- A CH-47 Chinook crashed during NVG training because the instructor pilot didn't realize the aircraft was descending. Although not a direct cause of the accident, the aircraft had one red-lighted radar altimeter. The red light is incompatible with NVG equipment. The light becomes unnoticeable during NVG operations because the lighting has to be dimmed almost completely to prevent goggles shutdown. Some units don't have adequate quantities of green-lighted altimeters, so they are waivering the requirement. They do this by requiring only one green-lighted radar altimeter for NVG operations.
- An AH-64 Apache was set down because of a fire onboard. Neither crewmember was hurt, but the fire burned for almost three-quarters of an hour. The aircraft was destroyed. Stagefields were reasonably close to the accident site so crash crews responded rapidly. However, the crews didn't have adequate water. Backup crews were called, but got lost en route. This slowed their response to the emergency. The route was well marked on the crash maps, but the crews weren't familiar with it. They hadn't trained on it.

Present, but not contributing. By their very nature, these factors are found by investigators because they have been overlooked by the units. Look at your unit. See if you have any "present but not contributing" factors. If you do, now is the time to correct them—before they turn into definite accident-causing factors.

Artificial Intelligence

and Its Applications for Futuristic Aircraft

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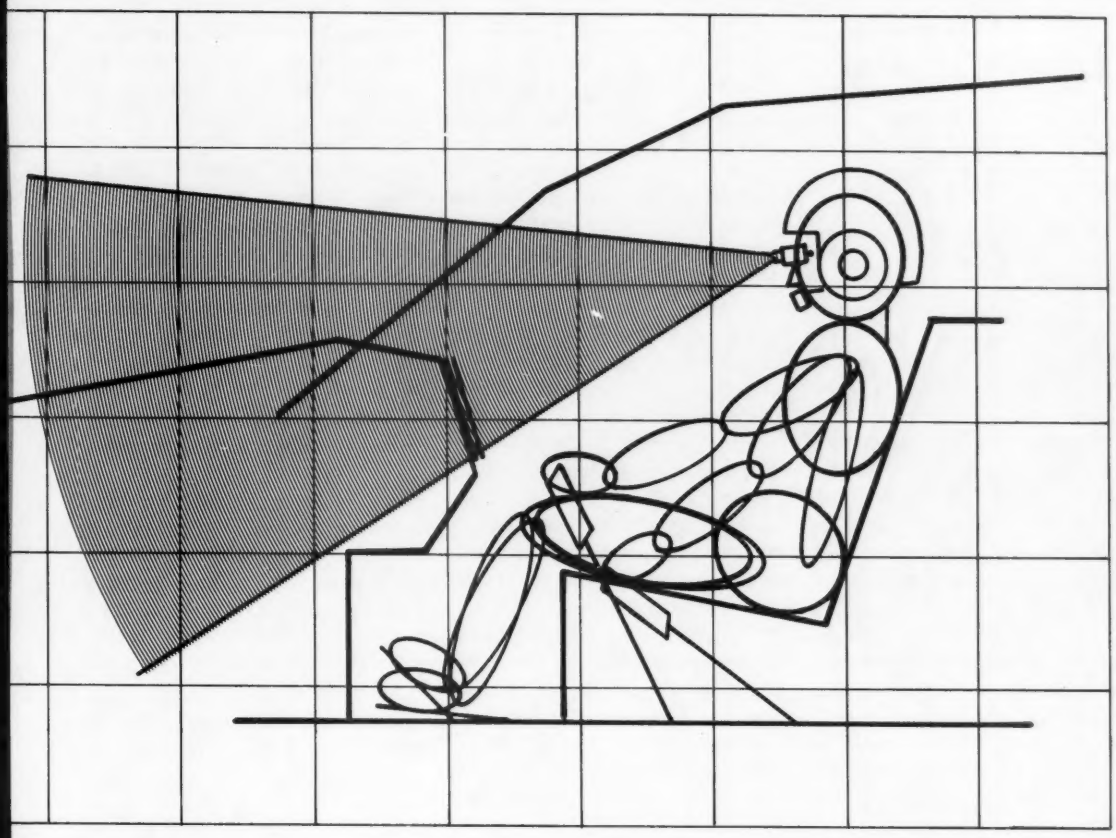
THE SCIENCE-FICTION movie industry has used machines that exhibit the characteristics of human cognitive skills for many years. The likeable R2D2 and C3PO robots of Star Wars fame are prime examples. The same technological advances exhibited by these machines can be applied directly toward futuristic aircraft. Systems that can analyze new situations quickly and apply human-like decisionmaking skills to the chaos that is commonly found in a fast-developing aerial confrontation are a necessity in future aircraft. Aircraft that use integrated systems that incorporate artificial intelligence programing should survive advanced technology threats on future battlefields.

Knowledge-based systems are already being used to perform human skills that once took many years of effort to develop. Examples of these skills include diagnostics in medicine, diagnostics in maintenance of aircraft and in operational planning. The common theme in all of these activities is the vast amount of data that must be available to sort out a correct response in an acceptable amount of time.

Early developments in artificial intelligence dealt primarily with problem-solving strategies—strategies that required enormous amounts of memory storage and time to produce the desired results. Today, and in the future, technology will allow for more usable memory storage per device and require less time for performing an analytical procedure. Technology also will be physically adapted to the weight and size constraints of tactical Army aircraft. Along with the evolution in hardware will come better and more efficient computer languages with which to perform the tasks required by the programer.

The use of artificial intelligence or expert systems will improve combat survivability, target acquisition, navigation, weapon employment, aircraft



control, diagnostics in maintenance and training. The combat aviator of the future is concerned with each of these activities. They require extensive skills now developed through costly training and large amounts of time and effort.

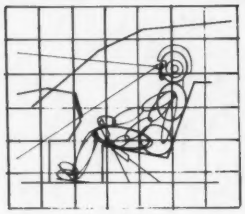
Credible human factors engineering for humans and machines to interface is a primary concern in the integrated cockpit design of the OH-58D Kiowa. Anthropometric measures of a notional crew, selection of displays and controls and environmental constraints as well should be considered in cockpit design. Only after all of these and other factors are considered can optimum performance be expected from the human and machine interface. Pilot overload cannot be overlooked when designing effective aerial platforms of the future.

Computers that apparently function as human and assist the pilot in making decisions will improve combat survivability. The pilot must be able to communicate with the onboard computer, using a natural language—plain English—instead of computer codes or abstract languages. Using a natural language will reduce the workload, allow more time for the pilot to handle his required tasks and, thereby, improve the probability of surviving in combat. The projected time for the availability of a viable voice interactive system on the commercial market is forecasted for the 1990s.

Computers must interface with onboard navigational aids. Computers must analyze raw data inputs from external sources such as the global positioning system and inertial navigation systems. The reduction of the pilot workload is the overall goal. A short scenario of the current process is as follows:

- Navigational aids provide raw data for the pilot.
- Pilot interprets the raw data.
- Pilot correlates the new navigational information with his previous experiences.

Artificial Intelligence



• Pilot makes the decision as to his location.

During this process, the pilot also must divide his attention among the tactical situation, target acquisition, weapons selection, aircraft control and threat avoidance, to name but a few tasks. Demands on aircrews are unrelenting. By using an expert system that continuously monitors navigational data, displays this information and integrates it into the known tactical situation, the probability of the aircraft's and crew's surviving as well as the mission's being accomplished will be increased.

Further use of knowledge-based systems that provide the pilot with guidance on battlefield doctrine could have an even greater impact on Army Aviation. The proposed system would integrate the target acquisition system with near real-time threat information. The resulting man and machine interface would allow the pilot to focus his combat power directly where it would be used most efficiently.

Specifically, the pilot would have access to the overall picture of the battlefield sector he is in and an overview of how his sector relates to the overall scheme of maneuver. This knowledge would allow for continuity of efforts on the battlefield. The pilot would know which of the threat forces he could engage, with a reasonable probability of kill, while allowing for his own continued self-preservation.

Artificial intelligence programing applications involving flight controls would reduce the training time required to produce a pilot capable of conducting combat missions. An expert system would provide a knowledge base that would compensate for the lack of experience and exposure to aerial combat. It is foreseeable that the aircraft would be capable of responding to the pilot, with the aid of artificial intelligence, without flight controls as they now exist. Through voice commands to the expert system, the pilot could cause the aircraft to respond. For example, the onboard computer would monitor data inputs and give corrective guidance to the flight controls and support systems necessary for flight, freeing the pilot to apply his ingenuity fully toward accomplishing the mission.

A most valuable application of artificial intelligence programing is found in aircraft maintenance. Currently, diagnostics in aircraft maintenance is a process that requires highly trained and experienced personnel. Maintenance personnel must apply and correlate new data with learned skills to solve advanced technological problems, especially those related to aircraft on the future battlefield.

Knowledge-based systems that provide the young, inexperienced person with the tools needed to perform diagnostic tasks will be the mainstay of future maintenance support. The rules of thumb, or heuristics, developed by experts in the aircraft maintenance field and incorporated in data bases will allow the novice to reach the expert's level of diagnostic skill. The shared knowledge from experts sparsely located throughout the maintenance support structure can be used to produce optimum aircraft availability.

Artificial intelligence programing also will be used in training crews for futuristic aircraft. The aircraft system must be capable of improving the skills of its crew even when they are not flying. Artificial intelligence applications in simulation training can expand the expertise of crews as chess players have benefited through current computer chess programing.

While the crew prepares to fly the mission, and mission parameters are

Example of a possible computer display that could be used by maintenance personnel.

This software texture scene illustrates a possible computer-generator flight path displayed in the cockpit of a futuristic aircraft. This scene depicts a preferred avenue of approach for the aircraft into the battle area.

being established, simulation training will allow for a proof of theory test. Aircrews will be able to simulate their mission, using the same systems they will use under actual conditions. Through simulation training more difficult tasks can be accomplished as the crew increases their capability in performing each task in an evolving battlefield scenario. Performance of tasks without the agony of learning from trial and error and having training available at any location and time should advance the skills of the novice crew. The return in savings in training costs and demonstrated performance will more than justify the application of knowledge-based systems.

The demands on the aircraft and crews on future battlefields will be awesome indeed. Advancements in technology by our adversaries, combined with our own, suggest that the relatively inexperienced personnel who are forecasted to fight on future battlefields will require systems that are integrated and user friendly. Indeed, the near future promises to provide exciting advancements in Army Aviation's implementation and use of artificial intelligence.

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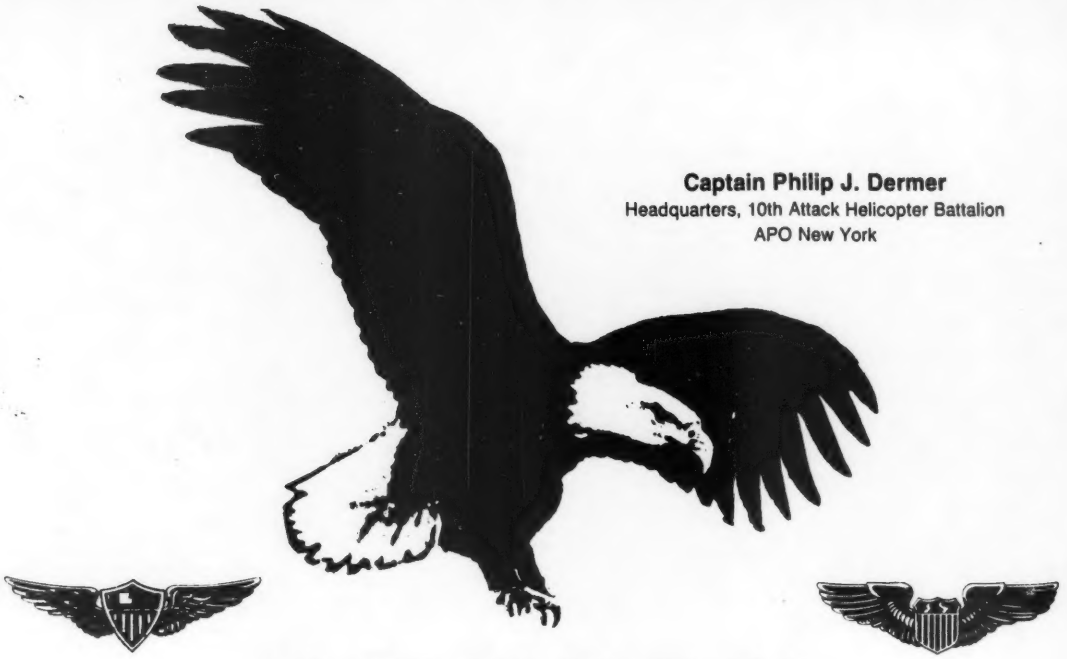

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APO New York

JAAT EAGLE 87

THE MOST EXTENSIVE joint Army and Air Force training exercise between units of the 1st Armored Division and the 81st Tactical Fighter Wing, took place in southern Germany in the area of Low Fly 7 from 17 to 21 August 1987. It was centered around the city of Nordlingen. To those taking part in this exercise, it was the most realistic and demanding training they had ever had. All units deployed to and staged the exercise out of the German air base at Leipheim, Germany, the home of Detachment 2, 81st Tactical Fighter Wing. This type of deployment was a first by the Army units for an exercise of this kind.

Participants

Units that took part were as follows:

- 511th Tactical Fighter Squadron from Bentwaters, England.
- Detachment 2, 81st Tactical Fighter Wing based at Leipheim Air Base, Germany.
- 10th Attack Helicopter Battalion, 4th Aviation Brigade from Illesheim, Germany.
- 2/59 Air Defense Artillery Battalion from Schwabach, Germany.
- OL-R, Detachment 2, 602d Air Support Operations Group.

Also, four civilian-manned tactical radar threat generators (TRTGs) from Ramstein and Hohenfels, Germany, were used in the exercise.[1]

Purpose

The Army units deployed to Leipheim mainly to improve the situational planning and mission awareness between the Army and Air Force. The planning phase of the exercise ranged from pre-mission ground planning to the time the actual joint air attack team (JAAT) took place in the battle area. The most important benefit of all was being able to conduct indepth, afteraction, face-to-face reviews between all the units. Normally, all elements of a JAAT meet in the battle area only for a transient period of time. Therefore, no provision exists to decide the outcome of the exercise or how to improve things that went wrong. As both the National Training Center (NTC) and Ironstar have proven, an afteraction debrief review is critical to a unit in highlighting its strengths and weaknesses, and where to concentrate to improve its training.[2]

Objectives

The training objectives for JAAT Eagle 87 were as follows:

- Exercise and test the procedures outlined in the U.S. Army, Europe (USAREUR) JAAT standing operating procedure (SOP).

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• Exercise the command and control necessary for proper timing and coordination of a JAAT, thereby aiming to increase the efficiency of a JAAT employment.

• Train Army and Air Force crews in an integrated high-threat radar and surface-to-air missile environment, using TRTGs and full-up multiple integrated laser engagement system (MILES)/identification friend or foe (IFF) Stingers.[3]

• Exercise multiple-team, battle handoffs in a JAAT environment.

• Integrate scouts' eyes and A-10 Thunderbolts' firepower.

• Provide the most realistic training for air defense and TRTG personnel.

• Provide afteraction review by visual feedback and face-to-face discussions.

• Tie above objectives together in developing framework for a continuous training program of joint Army and Air Force exercises on a standard basis and located throughout USAREUR.

Mission scenarios

The missions were based on locally derived, generic intelligence scenarios specifically developed for the timing of meaningful JAATs. Two missions a day for 5 days were flown against the scenarios.

The first enemy situation was a static buildup of an undisclosed size force. It appeared to be that of a regimental size (possible operational maneuver group) tank unit in a holding area preparing for possible operations against our division in 48 hours.

The second situation was the breakthrough in our division sector of an unidentified tank regiment in pursuit of an Army objective in our rear area. The first scenario, therefore, was developed to allow the first JAATs to be conducted against stationary targets.

The succeeding scenarios were developed for JAATs to be conducted against moving targets to stop a breakthrough in our division sector.

Force composition

The friendly force consisted of 6 A-10s divided into 3 sorties of 2 A-10s each, with the sorties divided by 15 minutes; an Army Aviation mix of 7 AH-1 Cobras and 3 OH-58 Kiowas; and a simulated 155 mm fire direction center. The opposing force (OPFOR) was the key to the whole exercise and developed specifically for the first time for this exercise. It consisted of 4 TRTGs capable of emitting the signals of ZSU-23-4s and SA-8 Geckos; 5 MILES/IFF Stinger teams (10 missiles); and numerous wheeled vehicles, which were equipped with MILES receivers representing various Soviet vehicles. All in all it proved to be an overwhelming threat environment.

Method of controlling/umpiring

The missions were filmed, using video recording equipment inside each TRTG van. Also used was a hand-held video camera, which was carried by an airborne controller who accompanied each mission.

USAREUR JAAT SOP ratification

The USAREUR JAAT SOP differed in several key areas from the events that actually took place during JAAT Eagle 87. First, the SOP target priority for JAATs is tanks, armored vehicles, air defense artillery (ADA) weapons, and then command and control vehicles. This is contrary to Army Aviation doctrine and teaching. Army Aviation believes that, regardless of whether the mission is a JAAT or simply a direct attack with helicopters alone, the primary target is the one that is the most immediate threat to the aviator. Command and control vehicles, ADA systems and the masses of armored vehicles that are left follow in order. This priority is based on many factors that differ with each mission. The Air Force differed on this as they prioritized ADA first and foremost. They did not consider armored vehicles or small arms as an immediate threat to them at all. This caused a minor schism at the planning levels between the Army and Air Force pilots. This was because the Army air battle captain (ABC) and his guns could not guarantee first and foremost that the target area would always be "ADA free" upon the arrival of the A-10s.

Second, the SOP states that the Army ABC authenticates the JAAT mission with the A-10 aircraft over voice radio. The Army at aviation battalion, and even brigade level, does not have the Air Force authentication tables. Without a forward air controller (FAC) or Air Force air liaison officer (ALO) in the same aircraft, this is an impossibility.

Third, and most important, the SOP does not make clear who should actually exercise positive control of the A-10s once they enter the battle area. This was a source of constant trial and error throughout the exercise. The bot-

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[1] The TRTG is a training device mounted on a 2½ ton truck. It is designed to add radar-directed ADA simulations to aviation battledrill training. The TRTG has onboard video cameras that allow filming ground-to-air engagements and facilitate postmission analysis. The TRTG can simulate any Soviet ground-to-air missile system in the search, acquisition and track modes. It can also provide a missile launch indication in the cockpit. The TRTGs main benefit is that it adds realism to the battledrill training.

[2] Ironstar is the term for the 1st Armored Division Army Training and Evaluation Programs (ARTEPs) conducted at Hohenfels, Germany. These ARTEPs are the European equivalent of the NTC ARTEPs.

[3] The MILES Stinger and the IFF Stinger are two different weapons configurations for training. The Stinger cannot be fitted with both. The IFF Stinger is for training by electronic means in the interrogation and reply mode 4 to determine whether aircraft are friend or foe. The MILES Stinger is used for training in the search, acquisition and tracking (by infrared) of aircraft. It can also "shoot" an aircraft by means of an antitank weapon effects simulator system cartridge in the Stinger. The MILES Stinger is equipped with a tracker-head-trainer that can acquire an aircraft's infrared signature as far as the operator can see. Once fired, the Stinger operator must track for 3 to 6 seconds to register a kill on the aircraft MILES receiver. The two systems complimented each other. They gave the ADA personnel proficiency in both systems in the most realistic environment they had ever been in.

OH-58 Kiowa

tom line finally agreed upon was that a person who was already trained (ALO or FAC), and who was airborne with the ABC or in his own helicopter, was the best control for the A-10s. This was true for several reasons. Army personnel are not trained to understand the Air Force terminology and timing for clear and concise control of close air support (CAS) aircraft, especially in hectic JAAT situations. The ABC is too busy and not usually in a position to personally control the A-10s. The forward Army scouts also are either too busy, can not always readily identify the target easily or are not in position, depending upon the situation. The scouts usually had to maneuver to get into position to clearly observe the target area. This took them away from what they were doing with their gun teams. It also put them in jeopardizing positions. The guns are either firing, masked or repositioning to another firing position, which negates their ability to provide the close control needed for the A-10s. In other words, because of the preoccupation of helicopters with the ground fight, an airborne FAC was thought to be the best possible solution. Being airborne rather than on the ground lessens communication problems. It allows the FAC to concentrate exclusively on control of the A-10s from wherever he chooses.

Regardless of who controlled the A-10s, the JAAT Eagle 87 missions showed that controlling CAS aircraft takes time—time that must be spent stationary observing the target area. The more time, the more dangerous to a helicopter.

Preplanned versus spontaneous JAAT

The word preplanned should never be associated with the word JAAT. The two missions a day that were flown were based on peacetime constrained Air Force time-on-target (TOT) times. Therefore, all mission planning and JAAT battle execution had to be centered around these specified times. The timing was next to impossible to achieve because of several factors.

First, the terrain that the Army helicopter pilots operated in was not their own normal training area, it was totally new to them. Because of the TOT constraints, there was no time for premission aerial reconnaissance by the Army scouts to find the enemy and develop the situation as needed for a successful JAAT engagement. It is estimated that it took twice the amount of time than if the missions had been conducted in our own general defense plan area.

Second, there were only a few OPFOR vehicles. They had considerable freedom of movement to operate in, unlike the restrictive boundaries of a training center. There were no prescribed boundaries for this exercise.

Third, the TRTGs and ADA Stinger teams set themselves up on controlling terrain and excelled in employing their systems through proper planning and synchronization. They prevented the Army aviators from developing the situation as they would have preferred, and instead forced them into reaction.

Last, throw in the natural German weather. The most challenging and realistic scenarios ever experienced by this unit were developed. Taken in combination, the variables needed for

Illustrations by Paul Fretts

the proper coordination and timing to set up the preplanned JAAT were simply not there the majority of the time. The Air Force would have to hold time and time again, while the Army maneuvered to get the battle area "ready."

Value of the OPFOR

The value of the OPFOR in this exercise cannot be overstated. The OPFOR ran the exercise. The synchronized employment of the TRTGs and the ADA Stinger teams posed a severe threat to the aviators. The TRTG systems represented were the SA-8 and ZSU-23-4. This gave both the Air Force and Army pilots something specific to look for and worry about. The TRTGs positioned themselves on the higher and more commanding terrain throughout the area. Stationed nearby each TRTG was a man-portable Stinger team equipped with a MILES/IFF interrogator. The Army aeroscouts took heavy losses in the first few missions from a unique tactic of the TRTGs and Stingers. The TRTGs would not turn on their generators until the helicopters were in close proximity. When close, the TRTGs would turn on their radars; acquire, track and fire in a matter of what seemed like seconds to the aviators. This tactic prevented the Army aviators from using their AN/APR-39s to track and locate the radars first. In addition, the TRTGs would notify the Stingers of the azimuth of an approaching aircraft, which put them more at the ready. This tactic was eventually defeated by the Army aviators through proper premission planning and an indepth intelligence preparation of the battlefield of likely terrain for a threat ADA system. They then searched early, located and identified these systems for targets of opportunity by engaging them with artillery or one of the Cobra gun teams. They did this preliminary search and identification of terrain before developing the situation for the enemy main body.

Specific highlights of the ADA engagements were as follows:

- IFF was 80 to 85 percent effective in proper interrogation and feedback procedures.
- Scout helicopters were harder to detect than AH-1 Cobras. A-10s were the easiest to detect overall. (The scouts were sometimes on the Stinger teams before they knew it.)
- Acquisition distances were sometimes 3 to 5 kilometers. The average engagement distance was between 800 to 1,500 meters.

To reemphasize, the ADA threat was one of the main reasons the timing for a JAAT could never be fully achieved. A very realistic point of vulnerability for the helicopter was proven; it does not need to be killed to keep it from doing its job. It just needs to be threatened enough to be prevented from doing what it intended to do. To do something unintended or unplanned creates additional time factors during a mission. In the case of the JAAT Eagle 87 missions, the additional time it took to kill or maneuver away from the ADA helped prevent the exact timing of the JAATs.

Air battle captain

Normal attack helicopter missions by themselves keep the ABC extremely

busy. However, also having to coordinate with the A-10s sometimes proved overwhelming to the ABC. Four radio reports became 5, and 14 things to do in the cockpit became 15. Trying to shift the artillery in a timely manner, position the scout and gun elements and brief the A-10 aircraft were not always workable at the same time. It sounds easy in the JAAT SOP. In reality it is not. The only way smooth coordination was ensured among all the elements taking part was to divide up the responsibilities among the scout aircraft and have the Cobras act on their own by listening to the situation at hand; and, as mentioned previously, having the CAS assets controlled directly by an Air Force controller. The Air Force controller then simply waits for the ABC to give the go ahead to enter the battle. The former keeps the latter advised of their status of ammunition, fuel and TOT remaining.

To the ABC the A-10s, although important, were seen as transient and yet overly time-consuming. They could only be worked in when the time and situation permitted. They simply could not show up on station, check in, receive an update and enter the fray. Holding times for the A-10s were frequently 20 minutes or more. This proved to be a hard learning point for the A-10 pilots. *In reality though, it is their ability to loiter that is one of the things that makes them so suitable for the JAAT mission.*

Afteraction reviews

The afteraction review made the exercise unique. The benefits of the joint afteraction review cannot be expounded on enough. With the availability of the video film of the TRTGs and the airborne controller, seeing oneself on film left little doubt in a pilot's mind of the outcome of an engagement with a TRTG, or of his actions in the target area. The terrain feature that one should have used to mask himself, or reposition after an engagement, was readily available on film in case a not-so-lucky aviator missed it on his way to being engaged. Conversely, the video film also showed how hard it can be for an ADA system to acquire, track and shoot down an aircraft when it is using the proper terrain flight techniques. The pilots came to understand that it was no sure thing, because they were being tracked, that they would automatically be killed. They, therefore, learned that ADA systems could be defeated by ways other than by killing them.

Key lessons

The missions were extremely difficult. Coordination and timing were never achieved to perfection levels. Yet it was, nevertheless, the most realistic training any of the units taking part had ever had. Herein lies the real benefits of this kind of training. The Army aviators learned how difficult it was to fly in unknown terrain against a properly employed ADA threat array. It was an array that prevented them from even getting to the battle area, let alone beginning to develop a situation suitable for the timing of JAATs. They learned the difficulty that it takes to guide the A-10 pilot into the target area; identify, clearly and quickly, the target; and give the best attack heading to the highest payoff target on the battlefield.

Air Force pilots learned of the in-depth and time consuming pre-mission planning the Army aviator must do before he can even take off on the mission. More important, they learned that they are usually transient to a battle, whereas the Army is not. The Army's work does not end when the A-10s egress from the battle area. It also proved to the A-10 pilots that they cannot hold in an area for a lengthy period of time just because they do have fuel remaining. This is because the threat does not stand still.

The bottom line learned at JAAT Eagle 87 by the Air Force was that the best possible scenario of having the enemy where you want them, when you want them and how you want them, can never be preplanned! The situation must be developed by the Army ground and aviation elements before the Air Force can join in. There is no sure way to tell when that will be possible.

We did understand, however, that in the next war, especially in the European scenario, it will not be as difficult to *at least locate* the enemy force in a timely manner. This is because JAATs are planned against large numbers of armored and mechanized vehicles. Battlefield smoke, dust, artillery and/or illumination will be present in some quantity in the battle area. This will ease the process of finding the enemy main formations by the Army aviators and target identification for the Air Force pilots.

Recommendations for future JAAT training

The benefits from all the units deploying to Leipheim to live, train and afteraction together were invaluable in understanding what a JAAT really is and what it entails for a JAAT to come off successfully. The USAREUR SOP states that JAATs will most likely be spontaneous. JAAT Eagle 87 proved that repeatedly. But regardless of whether a JAAT is preplanned or spontaneous, both the Army and Air Force pilots agreed on how devastating a JAAT would be if ever timed and synchronized properly.

It is recommended that Army Aviation and Air Force CAS units work together as a matter of SOP at least once a year on a rotational basis. When an Air Force detachment comes to Leipheim or Sembach for a 2-week rotation, it should train with Army Aviation units for 1 week. Incorporating this kind of training into USAREUR Regulation 350-7 would be a sensible place to start. JAATs would become second nature. Both the Army and Air Force would have a clearer understanding of what has entailed already in the battle or what must further happen for a successful JAAT. The USAREURJATT SOP would then be ratified by test.

WEAPONS and WEATHER

Captain Mark J. Reardon

HISTORY RECORDS numerous instances when the elements have had considerable direct and indirect effect on the outcome of battle. Wind, clouds, snow, rain, dust, light conditions and temperature extremes have all combined in various ways to affect soldiers and their use of weapons. Before the advent of any organized logistics system, the great rivers of Europe were used to ship artillery, and soldiers harvested crops for food as they passed through a region. During cold weather, rivers would ice up and the fields covered by snow brought

operations to a halt. As armies grew larger they were forced to coordinate their strategy with the moderate seasons and during winter withdrew to await the return of spring. Bold commanders would occasionally take advantage of this lull to launch successful local forays, but normally little fighting took place in the winter. In 1812 Napoleon gambled on defeating the Russians before the onset of winter. He miscalculated, which resulted in the destruction of an entire French army on the snowy steppes.

At the tactical level, adverse conditions could significantly affect even how individual weapons performed. Fighting during rainy conditions generally was avoided because flintlock muskets did not work well when wet. Poor visibility, or fog, hampered command and control by limiting the commander's ability to physically see the battlefield. The age of mechanization and modern technology brought some respite from environmental effects; however, commanders still had to consider weather as an important factor during combat. Control of soldiers during adverse weather and in low visibility conditions remained difficult. During both World Wars, tanks were confined to roads and air support was grounded by adverse weather, reducing combat to its most elemental form—man against man. Armies still timed their campaigns in accordance with weather, but now for different reasons. By 1943-44, the Axis (i.e., German, Italian and Japanese) troops preferred to attack when poor visibility and clouds hampered allied tactical air support. For the Americans and British, the reverse was usually true. The Battle of the Bulge and Normandy invasion illustrate how planners could employ existing or predicted weather as an effective combat multiplier at operational levels of war.

Today's commanders must also understand the effects of weather and environmental factors on their ability to fight. The importance of weather is recognized in FM 100-5, "Operations," which points out that, "the impact of weather on ground and airmobility and the effect...it will... have on weapons will affect tactics and the timing and course of operations." In consonance with warfighting requirements, the Directorate of Combat Developments (DCD) at Ft. Rucker, AL, has been heading efforts designed to ensure that Army Aviation can readily exploit the weather dimension on the AirLand Battlefield.

Army Aviation possesses the unique ability to perform in a wide variety of combat, combat support and combat service support functions that can make a potentially decisive contribution to the outcome of AirLand Battle through exploitation of the aerial maneuver dimension. However, the high threat posed by recent advances in Soviet air defense technology makes it necessary to conduct operations in the terrain flight mode to avoid acquisition and engagement. Under these conditions, adverse weather can impair mission accomplishment and endanger aviators and aircraft.

An examination of emerging aviation doctrine concluded that the present divisional and corps level weather support needed to be reconfigured. The study recommended direct weather support be provided to corps and division aviation brigades. Assigned weather personnel would provide, on a 24-hour basis, direct weather support for intelligence preparation of the battlefield, flight planning and mission execution. The staff weather officer (SWO) can advise the brigade commander on the potential impact of forecasted weather on mission planning as a member of his special staff. The SWO presents daily weather briefings with continuous updates and assists the S3 and S2 in assessing the general impact of environmental factors on all aspects of operations. Corps forecasting products are tailored to cover longer time periods and greater geographical areas since the corps aviation brigade (AVN BDE) area of operations and area of interest exceeds that of a divisional AVN BDE. The S3 and S2 would relay forecasts to lower echelons using organic communications networks. True synchronization of aviation operations and weather is made easier because dedicated weather teams with a detailed understanding of aviation systems can now provide direct forecasting and observing support for unique aviation requirements.

Observations from satellites, pilot reports, remote sensors and unmanned aerial vehicles (UAVs) will provide weather teams with data to support deep operations. The ability to penetrate the forward line of own troops (FLOT) during adverse weather, find targets and then egress all depend on accurate, detailed observations. During close operations, automated Army weather sensors, forward area limited observation program assets and target area weather information reports serve as the data base for weather predictions. U.S. Air Force (USAF) weather teams, by virtue of their location on the battlefield, employ their own observation capabilities to forecast conditions in the corps and divisional rear. The weather team also serves as a collection center for weather observations from all sources and then relays them to higher echelons.

Weather observations assume even greater importance because predictions can assess the impact of meteorological conditions on both friendly and enemy forces. Weather effects can be translated into intelligence data that indicate

when friendly forces can exploit environmental windows of opportunity by taking advantage of conditions that adversely affect the enemy. On the other hand, the extent to which threat forces can better forecast and use the elements to their advantage can provide them with a decisive edge in the application of combat power.

Adverse weather can degrade the performance of aerial weapons, especially precision guided munitions (PGMs). In the 1960s the USAF, faced with an increasingly lethal Soviet and Vietnamese integrated air defense system, began to develop modern television and laser guided munitions. These "smart" bombs allowed an aircraft to accurately deliver ordnance from survivable distances. Environmental factors, such as humidity, dust, smoke, rain, etc., were found to have significant effects on smart bomb targeting and acquisition. For instance, humidity could create a situation in which the human eye could see a target, yet the bomb's sensor could not. Different weapons were found to have different sensitivities to weather. Once a particular USAF weapon is uploaded, it can take as long as 6 hours to substitute another weapon. To provide strike planners with pre-mission predictive information, tactical decision aids (TDAs) were developed.

TDAs are a means of quantifying the performance of a system as it is affected by weather, and other environmental factors; physical characteristics of the launching platform and intended target; geometry of attack; targeting sensors; guidance systems; and sensor optics. In form, a TDA may range from something simple, such as tables or nomograms, to something elaborate, such as in interactive computer program. A TDA must be tailored to the system and to the circumstances under which it will be used. Rough TDA models for Army Aviation are currently under development by the Atmospheric Sciences Laboratory but have not yet been adopted for general field purposes. The DCD continues to monitor the progress of this program as it relates to Army rotary wing systems. Aviation-peculiar TDAs would determine effective ranges for friendly, and threat, lasers; lockon ranges for friendly, and threat, seekers; thermal changeover; night vision goggles performance; obstacle clearance; cargo/lift hover capability; forward looking infrared effectiveness; aviation hazard areas; friendly, and threat, detection and recognition ranges; and density altitude prediction.

Army TDAs provide commanders with guidelines that predict approximate system performance in relation to weather conditions on the battlefield. The capability to penetrate and operate beyond the FLOT is of utmost concern to aviation units assigned to fight deep. Observations from UAVs and remote sensors can serve as input for timely TDA generation by the weather team and S2. The capability to penetrate the FLOT during adverse weather conditions, and at night; acquire threat targets with thermal and other sensing devices, while avoiding detection by threat sensors; and interdict enemy follow-on echelons, while with standoff weapons depend on accurate, tailored TDA. Aviation forces during close operations overcome threat air defenses by acquiring enemy units at long ranges and then reporting their position or engaging with PGMs from defilade positions. Execution depends on identification of weather parameters that adversely affect use of onboard and threat weapons and acquisition systems. TDAs also provide planning guidelines for target identification, acquisition, and air-to-air or air-to-ground weapons employment during rear operations. TDA input is important to prevent the enemy from predicting and exploiting environmental factors better—factors that provide threat forces with an edge in combat power.

Throughout history, weather has had a significant impact at both the operational and tactical levels of war. Those who ignore weather suffer, while innovative leaders have used weather to their benefit. This still holds true today, as reflected by FM 100-5. Army and Air Force joint efforts must continue to develop and refine systems that capture and exploit critical weather data. Our goal is to provide the aviation force with rapidly processed, accurate weather data tailored to combat needs and transmitted to users in the field. As aviation continues transitioning to higher technology our dependence on accurate weather reports will continue to increase. The extent to which a commander can predict environmental effects, at specified times and places on the battlefield, may one day spell the difference between victory and defeat.

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Captain Mark J. Reardon was assigned to the Concepts Branch, Directorate of Combat Developments, U.S. Army Aviation Center, Fort Rucker, AL, when he wrote this article. He has since been assigned to the Headquarters and Headquarters Troop, 4/4th Cavalry, 3d Armor Division, APO New York.

Black Hawks Under the Southern Cross

Captain Christopher A. Acker

The time, 0300 hours; the place, North Queensland, Australia. Across the floor of the Australian outback streak two UH-60 Black Hawks, proceeding toward their destination, flying low level and using night vision goggles (NVG). Their mission—insert a long-range surveillance (LRS) detachment section behind enemy lines, remain undetected and return to their basecamp at Lakeland Downs.

Mission

The 17th Assault Helicopter Company (AHC) is the only UH-60 unit in the Pacific Basin. It supports the combat operations of the 25th Infantry Division Light (IDL) with air assault and air movement throughout the entire Pacific area. The unit deploys to numerous locations annually in support of 25th IDL training exercises. The unit deployed to Cape York Peninsula, North Queensland, Australia, to support the 1-21st Infantry (IN) Battalion (BN), 2d Brigade (BDE) of the 25th IDL, in exercise Diamond Dollar 87. The 1-21st participated in the exercise with a task force from the Aviation Brigade, 25th IDL.

The mission of the 1-21st in exercise Diamond Dollar 87 was to test the interoperability between the 25th IDL and the military forces of Australia. The exercise was conducted in the harshest environmental climate imaginable. The operation met with resounding success, but not without first identifying several problem areas in both logistics and doctrine for both U.S. and Australian military forces.

Diamond Dollar Exercise 87

The 17th AHC deployed eight aircraft and all of its aircrews to Australia to support Diamond Dollar 87. Vehicles, shop sets, tentage, prescribed load list, authorized stockage list and aviation intensively managed items (AIMI) deployed by ship, while the aircraft and crews deployed by air in two C-5A Galaxy aircraft.

The C-5A loadout of the Black Hawks was the first for the unit since initially receiving the aircraft in 1985. Normally, the unit deploys by ship when it deploys off Oahu, HI. The C-5A experience provided valuable training to maintenance personnel in preparing, loading, unloading and assembling the aircraft on arrival at the intermediate staging base, Townsville, Australia.

The first C-5A arrived at the Townsville Royal Australian Air Force (RAAF) Base around midnight on 26 September 1987. Unloading and reassembly began immediately. Static training conducted in Hawaii on reassembly of UH-60s after deployment in C-5As now worked to perfection. Two- and three-person reassembly teams, assisted by the aircrews, reattached stabilators, unfolded blades, reassembled tail rotors and installed fairings.

The next day all aircraft were test flown and preparations made for deployment to the exercise area of operations (AO) located about 250 miles away. The vehicles arrived by ship and were offloaded at Cairns, North Queensland. They convoyed to the unit's assembly area at Palmer River, North Queensland, and later to the unit's basecamp at Lakeland Downs. The aircraft deployed from Townsville after several days of NVG training were conducted at the Townsville RAAF high-range training area located several miles to the west of the city.

All aircraft and vehicles converged on the little dirt strip at Lakeland Downs and the billet site at Butchers Hill.

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For the next 4 weeks, the unit flew more than 400 hours, supporting the 1-21st Infantry Battalion and the lst Division, Royal Australian Army, flying a myriad of missions for both military units.

The Diamond Dollar 87 exercise started with a battalion task force air assault from the infantry assembly area at Bonny Glen on a suspected guerrilla location near Cooktown, North Queensland. The distance between the pickup zone (PZ) and the landing zones (LZs) was more than 70 miles each way. B Battery, 2-11 Field Artillery, part of the 1-21st IN BN task force was airlifted into a fire base to support the infantry scheme of maneuver.

The RAAF was tasked to provide aviation fuel for the exercise. It was at this point they realized that supporting UH-60s with fuel was going to be a different task from supporting UH-lH Hueys and OH-58 Kiowas normally supported by their petroleum (PET) platoon. The Huey is still the only troop carrier in the Australian military other than the CH-47 Chinook. The RAAF currently owns all the UH-1s. They provide support to the Army's ground forces since the Army has no organic airlift capability. The PET platoon, comparable to the U.S. Army's III/V platoon, provides the necessary support to their UH-1s. The PET platoon now realized that, to sustain continuous combat operations using UH-60s, large amounts of JP-4 would have to be moved forward.

Tankers had to travel the 100 miles from Cairns over dirt roads so rough that truck frames cracked under the stress. Tankers had to maintain 500 liters in them at all times when traveling over the roads to prevent the frames from cracking.

Fuel had to be transported initially by using 500-gallon, sealed, rubber drums slingloaded under RAAF CH-47s. In the end, the RAAF more than met the task as they provided excellent support to the 17th AHC during the entire exercise.

The Australian Army observed all UH-60 operations with anticipation. The RAAF received UH-60s in early 1988, which they will use for the first year. They will then transfer them to the Royal Australian Army along with all of the RAAF UH-lHs as part of a major reorganization of military hardware and personnel.

During Diamond Dollar 87 the UH-60 unit conducted around-the-clock support to the maneuver units providing air assault, aerial resupply, search and rescue, and command and control for the entire multinational force. The exercise AO was so large that on occasion LZs and PZs were more than 110 miles apart. The 17th AHC used NVG almost exclusively to resupply the 1-21st at night. LRS detachment insertions, extractions and resupply were almost always at night under NVG. Crews had to be switched constantly from day to night because of their inability to sleep during the day—the average daily temperature being 105 degrees Fahrenheit.

The UH-60 unit's crewchiefs and maintenance personnel performed yeoman's work as they sweated in the stifling dust and heat, completing maintenance tasks. The biggest problem turned out to be replacement of the main rotor blade upper rod end bearings. The dust and grit in the area seemed to destroy the Teflon liner inside the bearing case. Fortunately, a dozen of these bearings were brought to Australia with the unit. All of them were used during the exercise.

Taking part in the exercise was like taking a walk through an aviation museum. The RAAF's main fixed wing transporter was the C-7A Caribou. Caribou routinely flew in and out of their airstrip at Lakeland Downs sharing the parking apron with C-130 Hercules. Standing on Lakeland Downs Airstrip one could see UH-60s, OH-58s, C-7As, C-130s, Nomads and Porters.

The wildlife was spectacular with kangaroos and wallabies running free by the thousands. At night, drivers had to be extremely careful while driving since both animals like to run toward lights, even those on vehicles. The area had 15 of the 20 most poisonous snakes in the world not to mention the dry land crocodiles. Predeployment training on the proper method of avoiding these dangers worked to perfection. No member of the task force received injury from any of the wildlife indigenous to North Queensland, Australia.

During the last week of October, the exercise ended. The unit moved from its basecamp and airfield at Lakeland Downs to its intermediate staging base at Townsville. Extensive cleaning and maintenance were performed on all equipment since the dust and dirt of the Australian outback had taken its toll on avionics, bearings and engines. The exercise AO was in an area that was in its sixth year of a drought. Vehicles as well as aircraft had to be completely scrubbed and services performed before redeployment. The aircraft were prepared for C-5A loadout while the vehicles were loaded on a barge for the trip back to Hawaii.

Lessons learned

Diamond Dollar 87 proved to be the most challenging and opportunistic training exercise in which the Black Hawks had participated since their fielding to the 25th IDL. The 17th AHC is better prepared to conduct combat operations because of the training received during this extended exercise.

Many valuable lessons were learned during the exercise. High-frequency radios are a must when operating over combat areas as large as the Cape York Peninsula. Supported units were sometimes more than 100 miles from the aviation lifeline at Lakeland Downs. Light fighter doctrine, equipment and personnel allocations dictate that aviation elements operate from a fixed base. True, aviation platoons and companies can deploy forward and support for short periods of time away from the fixed base, but not for 30 days at a time without major support assets moving forward also.

Repair parts and special tools should always accompany aircraft. When a unit splits its deployment between two separate modes of transportation, such as aircraft and ship, these items should always go with the aircraft. Otherwise valuable downtime could result while waiting on a ship.

During peacetime, aviation units are not manned to support both day and night operations at the same time. Mandated crew endurance requirements dictate how many crews are available for day or night flights. Ideally, when a crew is flying NVG they remain on the night cycle during the entire exercise and sleep during the day. In Australia, crews who flew at night had to be changed out almost daily because they could not sleep during the day because of the excessive heat. Day sleeping was impossible; therefore, crews had to be switched to ensure adequate rest. This had an adverse effect on a unit's ability to provide crews for both day and night missions.

Always deploy the III/V platoon with 350 gallons per minute pumps. One hundred gallons per minute pumps trying to refuel a flight of UH-60s is time-consuming. This task could adversely affect the outcome of a time-sensitive operation.

When a unit deploys extended distances from its base of supply, consideration should be given to taking all or part of the AIMI. In the case of the 17th AHC, the only UH-60 unit in the Western Command, all of the AIMI could be taken without hampering operations back in Hawaii. Having the AIMI with the unit in the field located

Black Hawks from the 17th AHC airlifting M-102 artillery tubes during Diamond Dollar 87 in North Queensland, Australia.

Black Hawks Under The Southern Cross

5,000 miles away reduces the aircraft downtime and increases the unit's operational readiness.

Major reorganization

Following the successful operation in the Australian Outback, the 17th AHC experienced a major reorganization. The unit's aviation intermediate maintenance; motor pool; supply; flight operations; nuclear, biological and chemical; and headquarters section along with those of the other separate unit in the aviation BDE were used to help form a new assault helicopter battalion.

On 1 October 1987, the two separate companies under the aviation brigade, 25th Infantry Division Light reorganized into five companies and formed the 53d Assault Helicopter Battalion (Provisional). Before reorganization the aviation brigade was structured as shown in figure 1.

The reorganization was accomplished to provide better command and control for the two assault helicopter companies and to let the brigade staff fight with battalions instead of companies. Under the reorganization, aircraft maintenance was consolidated for the battalion into an aviation maintenance unit. Personnel and maintenance

FIGURE 1: The Aviation Brigade, 25th Infantry Division Light, before reorganization.

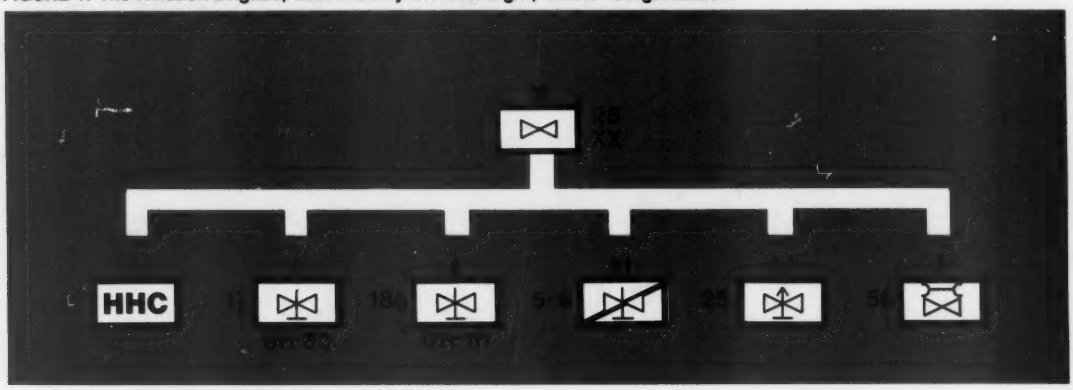
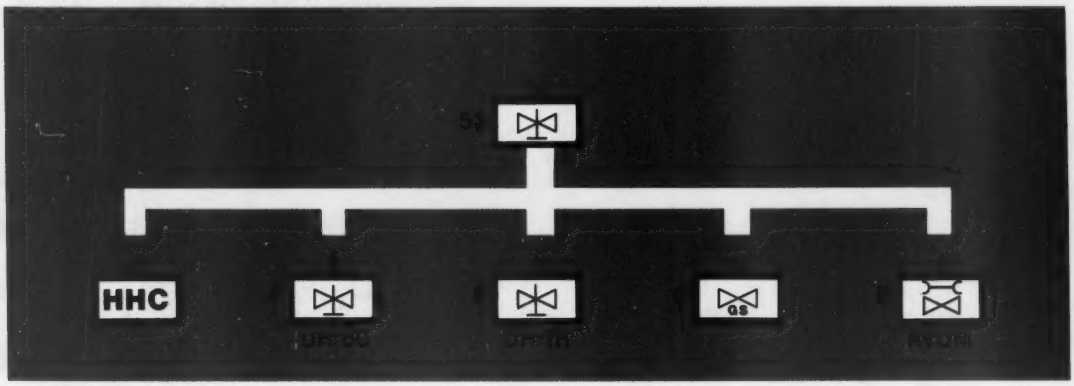


FIGURE 2: The new assault helicopter battalion.



equipment came from the service platoons of the two separate assault helicopter companies.

A command aviation unit was organized to handle general support duties for the division. Aircraft and crews for this unit came from the command, control and communications platoon of the brigade's headquarters and headquarters company (HHC), six OH-58s, and four UH-1s from one of the AHCs. The new assault helicopter battalion is structured as shown in figure 2.

Flight operations are consolidated at battalion level. Operations personnel and equipment from the two separate companies now work in the battalion S3 shop and man the new consolidated battalion flight operations. Vehicles for the battalion were cross-leveled from the original two AHCs to the various new units within the battalion. The battalion has no organic mess or medical sections. This support must still come from the brigade's HHC, the same as it did before the reorganization. The battalion has no organic class III/V assets. These assets also come from the brigade HHC.

The Aviation Brigade, 25th Infantry Division Light, is now organized as shown in figure 3.

ABOUT THE AUTHOR

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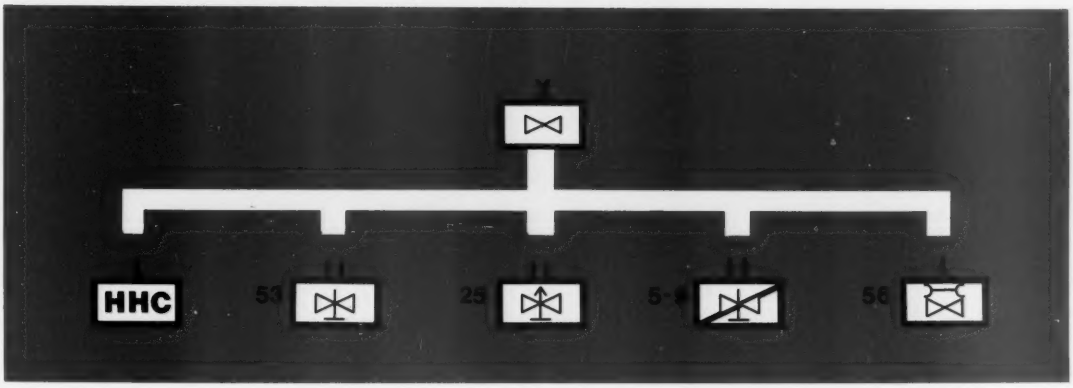
FIGURE 3: The Aviation Brigade, 25th Infantry Division Light, after reorganization.



ATC FOCUS

U.S. Army Air Traffic Control Activity

ATC REQUIREMENTS SURVEYS or "How Do I Get New ATC Equipment"

Mr. John D. Peebles
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U.S. Army Air Traffic Control Activity
Fort Rucker, AL

HOW DO I GET that new piece of equipment for my air traffic control (ATC) facility? This is a question that frequently comes from the field to the U.S. Army Air Traffic Control Activity (USAATCA), Ft. Rucker, AL. This subject was previously addressed in USAATCA ATC Bulletin 87-1, May 1987. Because of the volume of calls from the field, USAATCA is readdressing this subject in an effort to provide you with additional information.

Users of ATC equipment can request assistance in obtaining mission essential ATC equipment by submitting a facilities request (FR) form. A reproducible copy of this form is published in the "How To" Guidance for Management of ATC (Interim), dated 14 October 1987. This document will provide you with a step-by-step description on how to complete the FR form. Copies of this how to guidance form can be obtained through your major Army command (MACOM).

The FR should then be forwarded through your chain of command to your MACOM. The MACOM will, after reviewing your request for approval, assign an FR number, endorse and forward your FR to the USAATCA ATC Requirements Division.

The ATC Requirements Division is an integral part of the ATC Development Office within USAATCA. The ATC requirements survey is the first step, or catalyst, in the total validation, approval, acquisition, installation, test and acceptance process of ATC-oriented equipment for ATC facilities worldwide.

The contents of your FR will determine the type of survey action necessary; e.g., an internal survey that requires no temporary duty. The action officer assigned to your project will contact you by telephone for any additional information required to complete your survey.

However, for the purpose of this article, let's say an onsite survey is required.... The action officer assigned will send you an FR arrival message with a proposed survey date.... The next step in the process is to research your FR data and gather the material necessary to complete your survey.... You will then receive an advance message that will specify an exact date of arrival at your facility. It will also include whatever additional information or instructions are required to complete the survey.

The action officer will spend the necessary time at your facility to gather the information required to provide you, the provider of ATC services, a complete and accurate survey. The survey will be compiled, and if appropriate, your requirement will be validated and returned through your MACOM to you.

The final, but important part to this survey process is a MACOM approval memorandum that includes a request for implementation that should be returned to USAATCA within 60 days after receipt of the completed survey. This response is necessary for approval of further programming for your project.

The ATC Requirements Division is also responsible for the content of Army Regulation (AR) 95-9, "Terminal Air Navigation and Air Traffic Control Facilities," and Technical Bulletin 95-1, "U.S. Army Air Traffic Control and Navigational Aid Facility Standards." These two ATC publications are now being staffed internally within USAATCA. The draft publications will be released to the field for review before being published. The interim "how to" guidance previously mentioned in this article will be incorporated into AR 95-9, which will become chapter 13 in AR 95-2, "Air Traffic Control, Airspace, Airfields, Flight Activities and Navigation Aids."

Please remember, the FR is the document that will make your ATC requirements known to your MACOM and ultimately to USAATCA. The FR process is not difficult. Do not be afraid to use the system. The entire staff at USAATCA is there to provide you, the air traffic controller, with the best possible tools to do your job—that of providing commanders and Army aviators a modern, efficient and safe ATC system.

Readers are encouraged to address matters concerning air traffic control to: Commander, USAAVNC, ATTN: ATZQ-ATC-MO, Fort Rucker, AL 36362-5265.